Radionics™

D6500 Security Receiver
Operation and Installation Manual

This page intentionally left blank.

Table of Contents

Notice

The material and instructions covered in this manual have been carefully checked for accuracy and are presumed to be reliable. However, Radionics, Inc. assumes no responsibility for inaccuracies and reserves the right to modify and revise this manual without notice.

It is our goal at Radionics to always supply accurate and reliable documentation. If a discrepancy is found in this documentation, please mail a photocopy of the corrected material to:

Detection Systems, Inc.
Technical Writing Department
130 Perinton Parkway
Fairport, NY 14450

1. Introduction

The D6500 Security Receiver is a microprocessor based central station receiver. It offers several unique features:

- Fully modular construction with plug-in circuit boards for quick, easy service.
- Programmable formatting to receive data from most major brands of digital communicators.
- Easy /inexpensive updating (made possible by the modular cards and plug-in firmware).
- Superior signal processing to reduce noise and signal loss.
- Built-in standby power for uninterrupted signal and/or data processing during AC power outages.

The standard D6500 Receiver includes an Internal Printer Module/Printer Circuit Card (D6550) with an automatic printer paper take-up reel, an operator alert buzzer, Listen-In speaker, display panel with LED indicators, and an alphanumeric LCD display. Inside the D6500's metal enclosure are several modular printed circuit boards (cards): a Main Processing Unit (MPU) Card (D6510 or D6511), an MPU Terminator Card (D6515), a Power Supply Card (D6530), a Power Supply Terminator Card (D6535), two Digital Telephone line cards (D6540 or D6541), two Digital Telephone line terminator cards (D6545), an Internal Printer Module (D6550) and a backplane circuit board. The optional Printer Terminator Card (D6555), CRT RS-232 Port can provide connection to a CRT terminal or a supervised external printer.

As an option, up to six additional receiver line cards along with six additional line terminator cards can be installed in the D6500 to expand the receiver's capacity to eight receiving lines.

The D6500 is compatible with major digital communication formats (see Section 15 for format compatibility). When used with communicators this receiver recognizes alarm, trouble, restoral, opening, closing, cancel, and other supplementary messages.

The internal printer permanently records date, time, group number or transmission format and line number, account number, receiver number, and event by area, zone, and point. Other receiver status messages such as software revision levels of the MPU Card, line cards, and Internal Printer are recorded on the Internal Printer tape. The information is also shown on the D6500 LCD display. The D6500 can be programmed to send event messages to an external printer using the RS-232 port (on the Printer Terminator Card), as well as its internal printer.

The D6500 is programmed using the D5200 Programmer. The programmer must contain the 6500 Handler Program. You should be familiar with the operation of the D5200 programmer before attempting to install the D6500 Receiver.

> *Radionics recommends that you keep a D5200 programmer loaded with the 6500:MPU and 6500:LINE product handler in the central station at all times.*

2. Emergency Procedures

Section 24 of this manual contains a Service Information form. This form is provided for your convenience and protection in case of an emergency. Radionics recommends that the data on this form be kept current and available to central station personnel at all times.

Radionics maintains a 24 hour Emergency Central Station Technical Support telephone number. If your D6500 Receiver becomes inoperable or experiences trouble receiving signals, the following steps should be taken:

1. Notify your supervisor.

2. Refer to Section 20, Troubleshooting Guide, in this manual.

3. **Warning!** Never remove the Power Supply Card, Power Supply Terminator Card, MPU Card, MPU Terminator Card, Printer Terminator Card, or Printer Module while power is connected to the receiver.

4. If you have a receiver spares package and need to replace a circuit card or module, you may contact Radionics Technical Support for assistance.

Before Calling Radionics Technical Support:

1. Have this manual nearby and opened to Section 4. Receiver Card Functions and Component Locations.

2. Have your spares package, D5200 Programmer, D6500 Program Entry Guide, Emergency Data Sheet, and Program Record Sheet nearby.

3. Know the location of the AC power transformer for the receiver.

4. Know the location of the telephone line jacks for the receiver.

5. Know the telephone numbers to the receiver's Digital Telephone line cards.

6. Know the exact nature of the problem you are experiencing, e.g. description of reports, LED's lit, Operator Alert Buzzer, noise on speaker, etc.

7. Have the Service Information form near by (see Section 24).

Call Radionics Technical Support for Receiver Emergencies:

Monday through Friday, 8:00 AM to 5:00 PM PST call: 800-538-5807

All other times call: 408-757-8877 (Collect Calls are not accepted) Leave your name, company name, area code and phone number — a Technical Support Representative will call you back.

This __24 HOUR SERVICE__ is __only__ for Radionics Central Station Receiver __EMERGENCIES__!

---

3. Specifications

DIMENSIONS
Table Mount: 17.5" wide, 7.0" high, 19.5" deep
Rack mount: 19.0" wide, 7.0" high, 19.5" deep

CABINET FINISH
Aluminum/dark gray semi-gloss enamel.

POWER INPUT
16.5VAC, 50VA, Class 2 plug-in transformer

CURRENT REQUIRED (Milliamperes)

Line Cards Installed	8	7	6	5	4	3	2
Idle:	1000	860	780	690	600	420	320
Processing:	1000	860	780	690	600	420	320
Printing:	1400*	1260*	1090*	1000*	900*	820*	720*

* less than 1 second peaks

STAND-BY POWER
12 VDC, 12 amp hour (two 12 volt, 7 amp hour rechargeable sealed lead-acid batteries, Part Number D126)

ELECTRICAL PROTECTION
Built-in surge protection on AC input, all line cards, and RS232 connections. Circuit breakers on AC and battery power supply.

TELEPHONE CONNECTIONS
RJ11C modular jacks

FCC REGISTRATION
AJ996H-15725-DT-E

The D6500 Receiver is FCC registered under Part No. 68 using the RJ11C Interconnect which may be ordered from your local telephone company.

NOTICE:
This equipment generates, uses and can radiate radio frequency energy, and if not installed in accordance with this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

RINGER EQUIVALENCE
0.2B (AC)   1.7B (DC)

DISPLAY
Screen size: 0.7" high, 6.0" wide dot matrix liquid crystal display (5 x 7 dots per character). Displays two separate lines of 40 characters each.
LED display section indicates receiver status, and power source (AC or Battery).

LISTEN-IN
Built-in 2" speaker with head-phone jack and volume control.

CLOCK/CALENDAR
24 hour clock and 128 year calendar.

INTERNAL PRINTER
Prints 40 character line on $2^3/_8$" wide electro-conductive paper.

Monitors paper supply and includes automatic paper take-up reel. The Printer Terminator Card (D6555) provides an interface port for connection of a supervised external printer or unsupervised CRT.

OUTPUTS
Standard head-phone jack for Listen-In with auxiliary listen-in mini-phone jack for external recording device and micro-phone jack to control external recorder.

One RS232 interface port for connection to an Automation Computer

Dry closure relay contacts (parallel buzzer operation): Relay rating: 2 Amps @24V AC/DC

LISTINGS AND APPROVALS
UL Central Station Burglary
UL Police Station Connected Burglary
Central Station Fire
Remote Station Fire
Factory Mutual
UL Canada

4. Card Functions and Component Locations
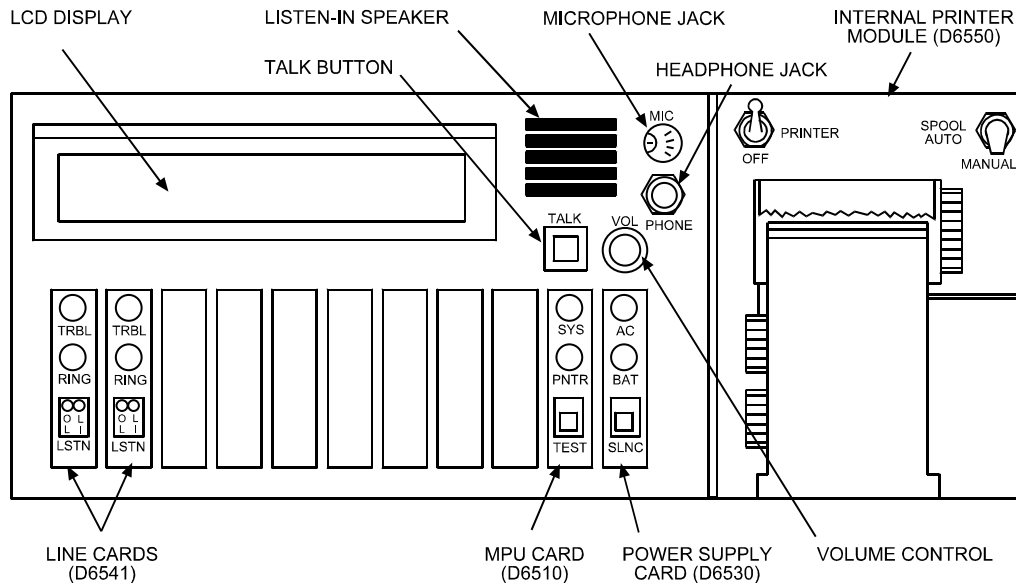
Figure 4-1: Front view of the D6500 Receiver

LCD Display: The D6500 Liquid Crystal Display can display up to 80 characters of information (two lines of up to 40 characters each). The top line displays event reports in the standard 40-character format. The bottom line shows the D6500 Receiver status: receiver mode, status of reporting devices, internal buffer status, and Listen-in information. See section 15.3 for more information.

Talk Button (TALK): The current version of the D6500 does not contain the appropriate software to operate Talk-Back.

Volume Control (VOL): The volume control allows the user to select the level of audio output through the Listen-In speaker or Headphone Jack output. The volume control does not affect the level of audio that comes out of the line terminator card.

Listen-in Speaker: The Listen-In speaker is found on the front of the D6500. When a Listen-In message is received, the D6500 connects the line card to the speaker. The speaker provides an amplified output of the audio information being received.

Microphone Jack (MIC): The current version of the D6500 does not contain the appropriate software to operate Talk-Back.

Headphone Jack (PHONE): The headphone jack is a 1/4" mono summary audio output. This output can be used to support headphones for Listen-In. When the headphone jack is used, it disconnects the speaker operation.

Digital Telephone Line Card (D6540 or D6541): A total of 8 line cards can be installed in one D6500 Security Receiver. The line card receives information, via the phone line, from the Control/Communicator, verifies its validity, and sends it on to the MPU Card. For additional information on the line card, refer to Section 5.

Main Processing Unit (MPU) Card (D6510 or D6511): The D6500 uses one MPU Card. The MPU Card takes the incoming information from the line card and can route the information to the internal printer, to an automation port, to the LCD display on the front of the Receiver, or to an external printer. For additional information on the MPU Card, refer to Section 6.

Power Supply Card (D6530): The Power Supply Card regulates the power received and used by other cards and the Internal Printer. For additional information on the Power Supply Card, refer to Section 7.

Printer Module (D6550): May be referred to as the *Internal* Printer Module. Provides a 40 character hardcopy printout of reports received at the D6500. For additional information on the Printer Module, refer to Section 8.
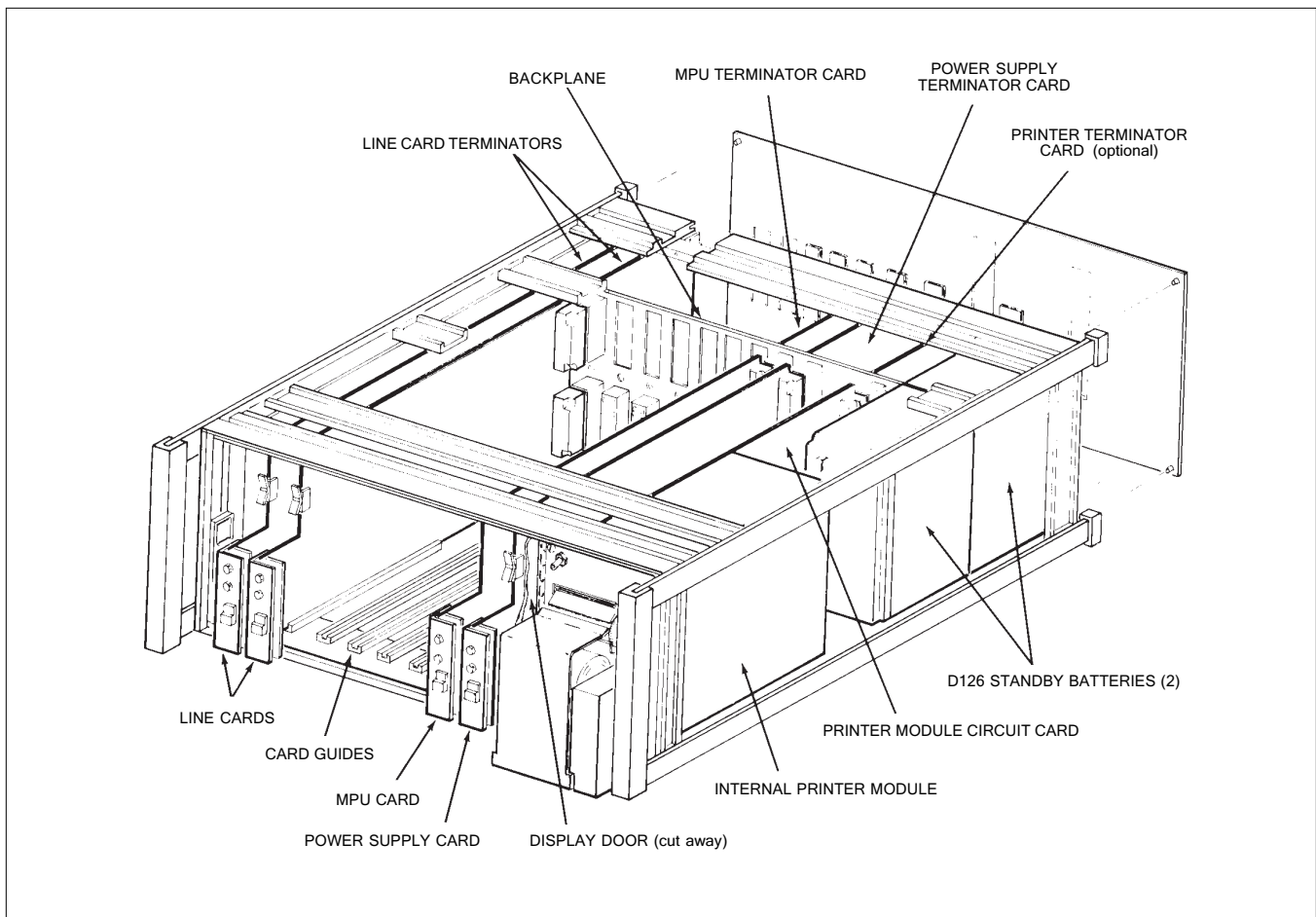
Figure 4-2: Receiver Card Placement

Digital Telephone Line Terminator Card (D6545):
Located behind the line card. Provides isolation and
protection for the line card against outside voltage surges
that may come in over the telephone line. Each line card
must have a line terminator card. See Section 5.

Backplane: Provides Input/Output pin connector sockets
for up to 8 line cards, one MPU Card, one Power Supply
Card, and one Printer module circuit card. It also provides
slots for connecting these cards to their corresponding
Terminator Cards.

MPU Terminator Card (D6515): Located behind the MPU
Card. Provides the D6500 with an Automation I/O Port for
an Automation Computer. When connected to the MPU
Terminator Card, it provides expanded report messages for
the D6500. See Section 6.

Power Supply Terminator Card (D6535): Located behind
the Power Supply Card. Provides isolation and protection for
the D6500 against outside voltage surges that may come in
over the power lines. It also provides terminal connections
for external batteries and auxiliary relay terminals for
connection of external annunciation device (parallel's
operation alert buzzer). See Section 7.

Printer Terminator Card (D6555): An optional card which
provides independent reporting via RS-232 serial port to an
external printer or CRT monitor. *The Printer Terminator
Card does not provide 6500 Automation Ouput format
reporting*, it prints or displays the same messages that are
printed on the D6500 internal printer or displayed at the
D6500 LCD display. See Section 8.

D126 Standby Batteries: Two D126 batteries can be
installed in the D6500 to provide up to 4 hours of emergency
standby power. The Power Supply Terminator Card contains
terminals for connection of external batteries for additional
standby time. See Section 10.

Printer Module Circuit Card (D6550): Contains the
hardware for the Internal Printer Module and the circuit card.
The circuit card is attached directly to the Internal Printer
Module. It provides the Printer Terminator Card with the
exact same messages that are printed out through the
Internal Printer. See Section 8.

5. Digital Phone Line Cards
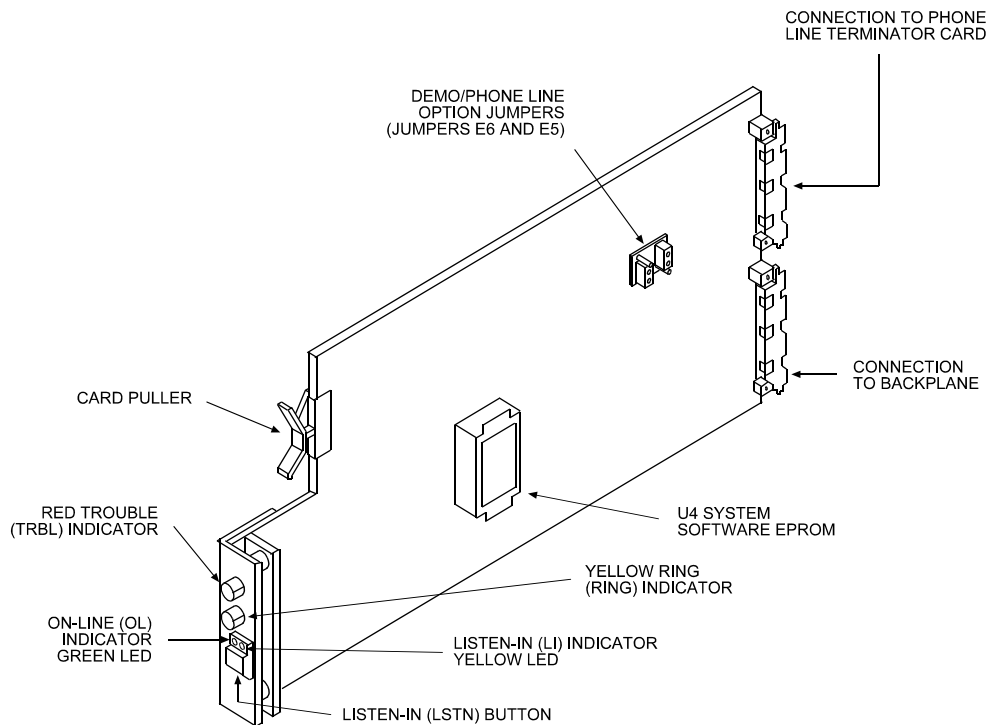
Figure 5-1: Digital Telco Line Card (6540 or D6541)

5.1 Description

Digital Phone Line Card (D6540 or D6541)

Connection to Backplane: This connection is used by the line card to send the reports to the MPU for processing. It also provides the line card with power from the Power Supply Card.

Connection to Line Terminator Card: The line terminator card is plugged into the line card, through the backplane, using this connection. This connection enables the line card to receive reports from the line terminator card.

Demo/Phone Line Option Jumpers: (E6 and E5). Used to set a phone line card for telco line supervision when the line card is connected to an operating phone line, or for demonstration purposes when the phone line card is not connected to a Telco line (e.g.: for use in-house to test communicators without connecting to a telephone line). See graphic on following page.
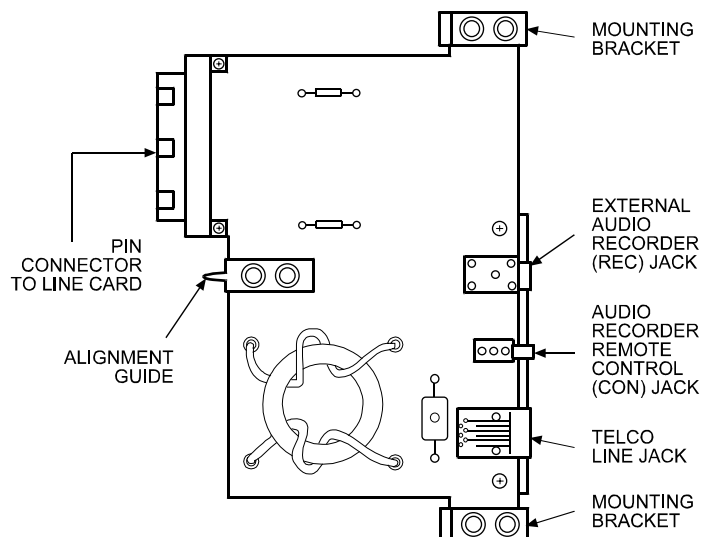
Figure 5-2: Digital Telco Line Terminator Card (D6545)
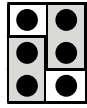
Supervision   Demonstration
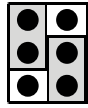
E5 E6   E5 E6

Place jumper plugs as shown for the desired option (re-move the sealant to change the jumper configuration).

Caution: *DO NOT connect a telephone line to a phone line card when in the Demonstration mode. A ring signal can cause serious damage the line card.*

CAUTION

Jumpers: (E3 and E4) Used for EPROM memory programming Do not alter unless instructed by literature or a Radionics customer service representative.

Line Card Ring Indicator (RING): This yellow indicator lights when ringing voltage is detected on the telephone line connected to the line card. This indicator will light before each incoming call is answered by the receiver. *This indicator operates even when the D6500 is powered down or in programming mode to alert you of incoming signals.*

Listen-in Button (LSTN): The **LSTN** button is used to manually transfer a line card with Listen-In information to the Listen-In Speaker. This button is also used to manually disconnect the D6500 from a Listen-In call in progress. To select a card for Listen-In, press the **LSTN** button of a card in the Listen-In mode (the yellow "**LI**" LED will be lit). To disconnect a card, press the **LSTN** button of the line card shown in the D6500 LCD display.

> **On Line Indicator (OL):** The green LED on the left side of the Listen-In button lights steadily after the receiver has answered the incoming call and flickers as data is being received. This LED is active until the entire transmission has been acknowledged and the telephone line has returned to the on-hook condition (ready to receive signals).

> **Listen-In Indicator (LI):** The yellow LED on the right side of the Listen-In button lights when the line card is in Listen-In mode.

Trouble Indicator (TRBL): This red indicator flickers dimly and may occasionally flash brightly while the receiver is operating. This indicator glows steadily when voltage on the incoming phone line is lost, or when the Digital Telephone line card or Digital Telephone line terminator card fails. The failure activates the reporting device(s) which record the troubled line and its line card number (see Section 20, Troubleshooting Guide for corrective action).

U4 System Software EPROM: Contains line card operating code. This EPROM is replaced during a firmware update when features are added or functions are changed.

Line Terminator Card (D6545)

Alignment Guide: Provides connection stability, and acts as a guide when connecting the Terminator Card to the line card.

Audio Recorder Remote Control (CON) Jack: Used to connect remote control for use in recording Listen-In events.

External Audio Recorder (REC) Jack: Used to record a Listen-In session.

Mounting Brackets: Connects the Terminator Card to the D6500 chassis and provides chassis/earth grounding.

Pin Connector to Line Card: Provides direct interface between the Terminator Card and the line card.

Telco Line Jack: A standard telephone line is connected to this jack. This is where the D6500 first receives its calls from the Control/Communicator.

5.2 Card Installation

It is not necessary to disconnect power when removing, replacing or installing *phone line cards* (D6540 or D6541), or the *phone line terminator cards* (D6545) **however, it is recommended that you remove power if possible** (see Section 9.6 *Powering Down the Receiver*). You should touch the receiver's frame before handling any circuit card to discharge static electricity from your body.

Installing Phone Line Terminator Cards

1. Remove the rear panel from the receiver.

2. Two phone line terminator cards are installed in the receiver when it is shipped from the factory. Insert a Terminator Card in the slot next to the phone line terminator cards which are already installed in the back of the receiver (If replacing a failed Terminator Card, remove the defective card and insert the new card in the same slot).

3. Align the top and bottom of the card with the card guides in the enclosure. Slide the card into the enclosure so that the metal alignment guide pin on the back of the Terminator Card is inserted in the hole in the back of the D6500's backplane circuit board.

4. Mount the Terminator Card in the receiver cabinet by securing the bracket screws at the top and bottom of the Terminator Card to the mounting rails at the top and bottom edges of the cabinet. *Make sure the screws are firmly tightened — the screws provide the ground connection required for reliable receiver operation* (see Section 22).

5. Repeat this process for all additional Terminator Cards. **NOTE:** Do not install spare line cards and do not connect phone line cards to the spare Terminator Cards (see Section 22).

6. Gently pry off the appropriate plastic rectangular cover plates from the receiver rear panel so that the jacks on the cards are accessible when the rear panel is put back in place. Secure the rear panel on the receiver.

7. Connect appropriate telephone line cords to the Phone Line Jack on the terminator cards.

Installing Phone Line Cards

1. Install the phone line terminator card(s) as described above.

2. Make sure the Demo/Phone Line option jumpers on the line card are set appropriately (see Figure 5-1).

3. Open the display door on the receiver. Two phone line cards are installed in the receiver when it is shipped from the factory. Slide a line card into the slot next to the line card which is presently installed in the receiver. As you look into the receiver, note that the next available line card slot is labeled "J3" on the receiver's backplane circuit board (J3 designates this line card as Line 3, J4 as Line 4, and so on, up to J8 Line 8).

4. Load an appropriate 6500:LINE program into the receiver (see the D*6500 Program Entry Guide*).

   NOTE: When the line card is initialized (as indicated by a printer report) the "standard" 6500:LINE program is automatically loaded into the card. The standard program consists of the default settings shown in the program entry guide.

   You should not try to program or set time while the line cards are going through the initialization process.

5. Check your MPU Program to insure *Line Card #* is **Yes** for all line cards installed, and that each line card is connected to a phone line.

6. Main Processing Unit (MPU) Cards
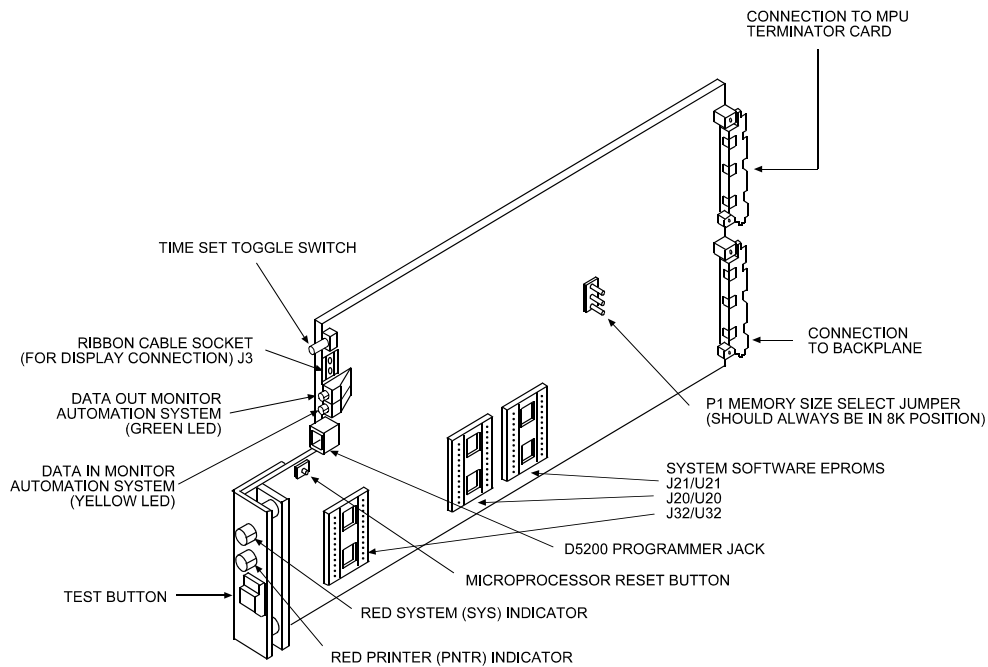
Figure 6-1: MPU Card (D6510 or D6511)

6.1 Description

MPU Card (D6510 or D6511)

Automation System Data In Monitor: **(**DS1,Yellow LED): This LED is normally lit. As data is received from the automation system, this LED begins to flicker or becomes dim.

Automation System Data Out Monitor: (DS2, Green LED): This LED is normally lit. As data is transmitted to the automation system, this LED begins to flicker or becomes dim.

Connection to Backplane: This connection provides interface for information coming from the line card and provides the MPU Card with power from the Power Supply Card.

Connection to MPU Terminator Card: The MPU Terminator Card is plugged into the MPU Card, through the backplane using this connection. The MPU Card sends the MPU Terminator Card information for Automation Format messages that the MPU Card received from the line card.

D5200 Programmer Jack: Used to connect the D5200 Programmer to the D6500 for programming the MPU and line cards.
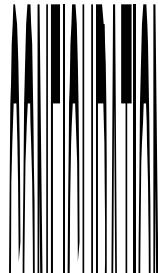
Figure 6-2: MPU Terminator Card (D6515)

Memory Size Select Jumper: (P1) Should always be in 8K position.

Microprocessor Reset Button: (S2) Pressing this button initiates a warm restart on the receiver. The program does not default, but the current signals and clock settings are erased.

⚠️ CAUTION

Caution: *DO NOT press this button unless directed to do so by Radionics personnel. Never press this button while the printer is printing, or when the printer paper is jammed*.

Printer Indicator (PNTR): This red indicator lights to indicate that the internal or external printer has failed. The PNTR indicator lights steadily when the internal printer is out of paper.

Ribbon Cable Socket: (J3) Fourteen conductor cable. For connection to the LCD Display on the front of the D6500.

System Indicator (SYS): This red indicator lights when a system failure has occurred or when the buffer contains 500 events (436 external messages, 64 internal messages).

⚠️ CAUTION

Caution: *When this indicator lights during operation, DO NOT power down the D6500 or remove the MPU. This could result in the loss of stored information.*

System Software EPROMs: (J21/U21, J20/U20, and J32/U32 on the D6511) Contains MPU Card operating code. These EPROMs are sometimes replaced during a firmware update when features are added or functions are changed.

TEST Button: The **TEST** button is used to initiate several functions of the D6500.

1. The TEST button is used to initiate a reporting device (printer) test. A message for the test appears on the receiver's display and is also sent to all primary devices. The D6500's internal printer prints the following to indicate a test:

   ```
   MM/DD HH:MM L8 ACCT  888  [TEST]  ZN  8
    (Actual Date and Time)
   ```

2. The TEST button is used to set the date and time in the D6500 (see Section 11, Clock and Calendar Controls).

3. The TEST button and SLNC buttons are pressed simultaneously to initiate/terminate the D6500's programming mode (see Section 12 for additional programming instructions).

Time Set Toggle Switch: Used to set the D6500 internal clock. To set the time and date, refer to Section 11.

MPU Terminator Card (D6515)

Alignment Guide: Provides connection stability, and acts as a guide when connecting the terminator card to the MPU Card.

Automation Computer (COMP RS-232) Port: An auxiliary RS-232 Port for connection to a computer terminal or to an automation computer for SIA/6500 mode Automation format reporting.

Configuration Jumpers: (J3) Lets you set up the RS-232 Data I/O protocols for Automation format reporting. For information on configuring J3, refer to the *D6500 Computer Interface Installation Manual* (*74-05313-000*). The D6500 can provide the following protocols:

- TXD and RXD (Transmit and Receive Data)
- RTS/CTS (Ready to Send/Clear to Send)
- DSR/DTR (Data Set Ready/Data Terminal Ready)

⚠️ CAUTION

Caution: *If you are not connecting an automation computer to this port, LEAVE THESE JUMPERS IN THE STANDARD POSITION AS SHIPPED. Certain jumper configurations could cause permanent damage to the RS-232 output and may also damage other components in the D6500*.

Mounting Brackets: Connects the terminator card to the D6500 chassis and provides chassis/earth grounding.

Pin Connector to MPU Card: Provides direct interface between the terminator card and the MPU Card.

6.2 Card Removal and Replacement

The D6500 must be powered down before removing, replacing or installing the MPU Card (D6510 or D6511) or the MPU terminator card (D6515).

Removing the MPU Card

1. **Power down the Receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Carefully grasp the metal front edge of the MPU Card and slide it two or three inches out of the enclosure.

3. Unplug the ribbon cable connecting the LCD display to the MPU Card. Use caution when disconnecting this cable. BE CAREFUL NOT TO BEND THE BOARD. Grasp the plastic plug connected to the MPU board at the end of the cable and gently pull it away from the plane of the circuit board (see Figure 7-3).

4. Pull the MPU Card straight out of the card guide.

Replacing the MPU Card

1. **Power down the Receiver** (see Section 9.6,
    Powering Down the Receiver).

2. Remove the defective MPU Card from the
    enclosure as described above.

3. Align the top and bottom of the MPU Card with the
    card guides. Slide the card into the enclosure.

4. Re-connect the ribbon cable to the MPU Card.
    Orient the cable so that it comes off of the MPU
    Card toward the front of the receiver.

5. Power-up the Receiver and re-load the customized
    6500:MPU and 6500:LINE programs from the
    D5200 programmer (see Sections 9.6 and 12).

    NOTE: Do not try to program or set time while the
    cards are going through the initialization
    process.

7. Power Supply Cards
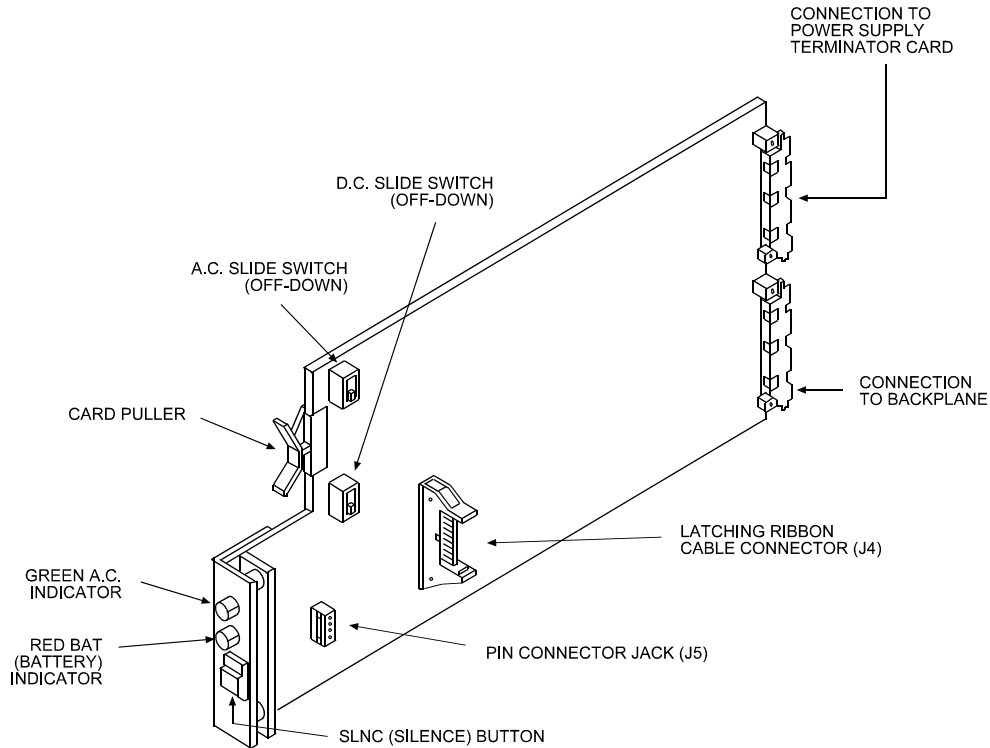
Figure 7-1: Power Supply Card (D6530)

7.1 Description

Power Supply Card (D6530)

AC Indicator (AC): This green indicator is lit while the receiver is operating on AC power. If AC power is lost, this indicator begins to blink and the receiver automatically switches to battery standby (see Section 10).

AC Slide Switch: (S1) In the OFF position (down) it disconnects AC power at the Power Supply Card. (AC power continues to be supplied to the Power Supply Terminator Card until the AC transformer is disconnected.)

Battery Indicator (BAT): This red indicator lights when the battery is low or when the battery is missing (see Section 10).

Connection to Backplane: Through this connection, the Power Supply Card provides power to all of the Cards and Modules in the D6500.
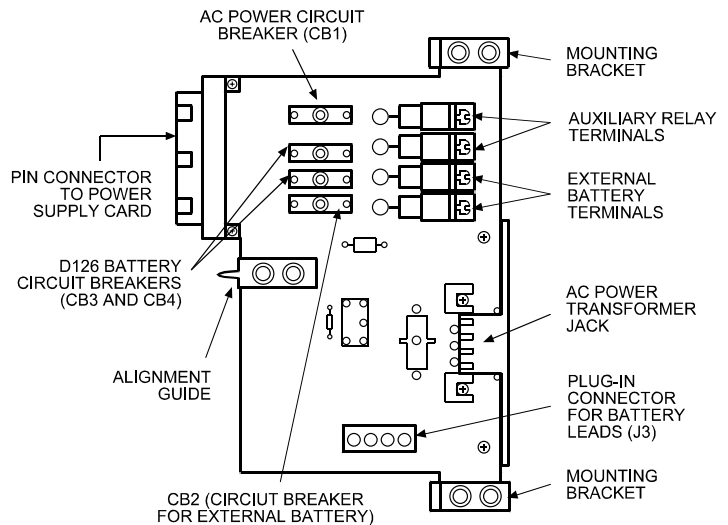
Figure 7-2: Power Supply Terminator Card (D6535)

Connection to Power Supply Terminator Card: The Power Supply Card is plugged into the Power Supply Terminator Card, through the backplane, using this connection. This connection provides power to the Power Supply Card from the Power Supply Terminator Card.

Battery Switch: (S2) In the OFF position (down), it disconnects battery power at the Power Supply Card. Battery power is supplied by the D126 Standby Batteries or the external DC power supply. Battery power continues to be supplied to the terminator card until all DC sources are physically disconnected.

Latching Ribbon Cable Connector: (J4) For connection to Listen-In/Talk-Back controls on the display door.

Pin Connector Jack: (J5) Four-pin Connector for wiring harness which supplies backlight power to display panel LCD.

Silence Button (SLNC): The SLNC button is used to initiate several functions of the D6500:

1.   Press this button to silence the operator alert buzzer.

2.   In the Manual Mode, press the SLNC button to view and display additional messages received.

3.   The SLNC and TEST buttons are pressed simultaneously to initiate/terminate the D6500's programming mode.

4.   The SLNC button is used to initiate Manual System Tests (see Section 13 for details).

Power Supply Terminator Card (D6535)

Alignment Guide: Provides connection stability and acts as a guide when connecting the terminator card to the MPU Card.

AC Power Circuit Breaker: (CB1) A reset button for the AC power is also located on this Circuit Breaker.

AC Power Transformer Jack: Used to connect the D1650 Transformer.

Auxiliary Relay Terminals: Terminals 3 and 4 are for connection of auxiliary device (e.g.: external buzzer). Relay operation parallel's operator alert buzzer. Relay is dry contact, Form C, 2 amp rating @24VAC or 24VDC.

D126 Battery Circuit Breakers: (CB3, CB4) Reset buttons for the D126 batteries are also on these Circuit Breakers.

External Battery Circuit Breaker: (CB2) A reset button for the external battery is also located on this Circuit Breaker.

External Battery Terminals: Terminals for connection of external DC supply: Terminal #1 is negative (-), Terminal #2 is positive (+).

Mounting Brackets: Connects the terminator card to the D6500 chassis and provides chassis/earth grounding.

Pin Connector to Power Supply Card: Provides direct interface between the terminator card and the Power Supply Card.

Plug-In Connector for Battery Leads: Parallel wiring connection to D126 batteries. Red = Positive (+), Black = Negative (-).

7.2 Card Removal and Replacement

Caution: *The D6500 must be powered down before removing, replacing or installing the Power Supply Card (D6530), or the Power Supply Terminator Card (D6535).*

Touch the receiver's frame before handling any circuit card to discharge static electricity from your body.

Removing the Power Supply Terminator Card

1.   **Power down the Receiver** (see Section 9.6, *Powering Down the Receiver*).

2.   Unplug the AC transformer connector from the card: Squeeze the top and bottom of the plug to release it from the socket on the card.

3.   Remove the Rear Panel from the receiver.

4.   Disconnect the leads from the external standby battery (terminals 1 & 2 on Power Supply Terminator Card).

WARNING: *To avoid electrical shock, disconnect the battery leads or switch off the power supply before handling the leads connected to these terminals*.

5.   Unplug the standby battery connector on the Power Supply Terminator Card (connector J3).

6.   Unscrew the screws from the mounting brackets at the top and bottom of the terminator card.

7.   Pull the terminator card straight out of the card guide.

Replacing the Power Supply Terminator Card

1. **Power down the Receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Remove the defective Power Supply Terminator from the enclosure as described above.

3. Align the top and bottom of the terminator card with the card guides in the enclosure. Slide the card into place.

4. Mount the terminator card in the receiver cabinet by securing the bracket screws at the top and bottom of the terminator card to the mounting rails at the top and bottom edges of the cabinet. *Make sure the screws are firmly tightened — the screws provide the ground connection required for reliable receiver operation* (see Section 22 for further information).

5. Re-connect appropriate wires to the external battery/external buzzer terminals on the terminator card.

> **WARNING:** *To avoid electrical shock, disconnect the battery leads or switch off the power supply before handling the leads connected to the external standby battery terminals.*

6. Re-connect the standby battery connector to the J3 connector on the Power Supply Terminator Card.

7. Replace the rear panel.

8. Plug the AC transformer into the transformer socket on the Power Supply Terminator Card.

9. Return the AC and BAT switches to the ON (up) position.

Removing the Power Supply Card

1. **Power down the Receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Remove the Printer Module from the receiver (see section 8.2).

3. Reach into the Printer Module compartment:

   a. Unplug the wiring harness from the 4-wire Pin Connector Jack near the front of the Power Supply Card.

   b. Unplug the wiring harness from the Latching Ribbon Cable Connector on the Power Supply Card. You must push open the socket's end tabs to eject the wiring harness from the socket.

4. Unplug the ribbon cable from the Ribbon Cable Connector socket on the MPU Card. Use caution when disconnecting this cable. Do not pull on the cable while unplugging it. Grasp the plastic plug at the end of the ribbon cable and gently pull it away from the plane of the MPU circuit board (see Figure 7-3).

5. Slowly pull the Power Supply Card straight out of the card guide.

Replacing the Power Supply Card

1. **Power down the Receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Remove the defective Power Supply Card from the enclosure as described above.

3. Align the top and bottom of the Power Supply Card with the card guides. Slide the card into the enclosure.

4. Re-connect the wiring harnesses to the 4-wire and Latching Ribbon Cable Connector on the Power Supply Card.

5. Re-connect the ribbon cable to the MPU Card. Orient the cable so that it comes off of the MPU Card toward the front of the receiver.

6. Put the Printer Module back into the enclosure and turn on the Printer Control Switch.

7. Power-up the receiver.

AC SLIDE SWITCH
(DOWN OFF)

RIBBON CABLE CONNECTOR
TO LCD DISPLAY

BATTERY SLIDE SWITCH
(DOWN OFF)

TIME SET
TOGGLE SWITCH

D5100
PROGRAMMER JACK

LATCHING RIBBON
CABLE CONNECTOR

MPU CARD

POWER SUPPLY CARD

4 WIRE
PIN CONNECTOR JACK

PRINTER MODULE COMPARTMENT
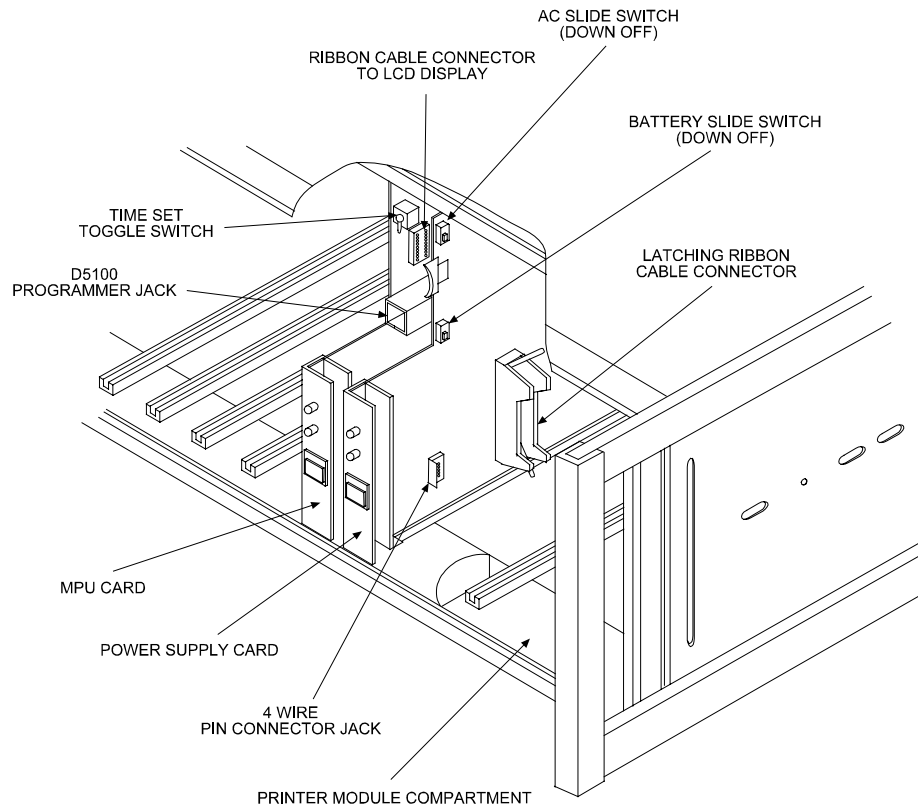
Figure 7-3: Power Supply and MPU Card Connectors and Switches (cut-away view)

# 8. Printer Specifications
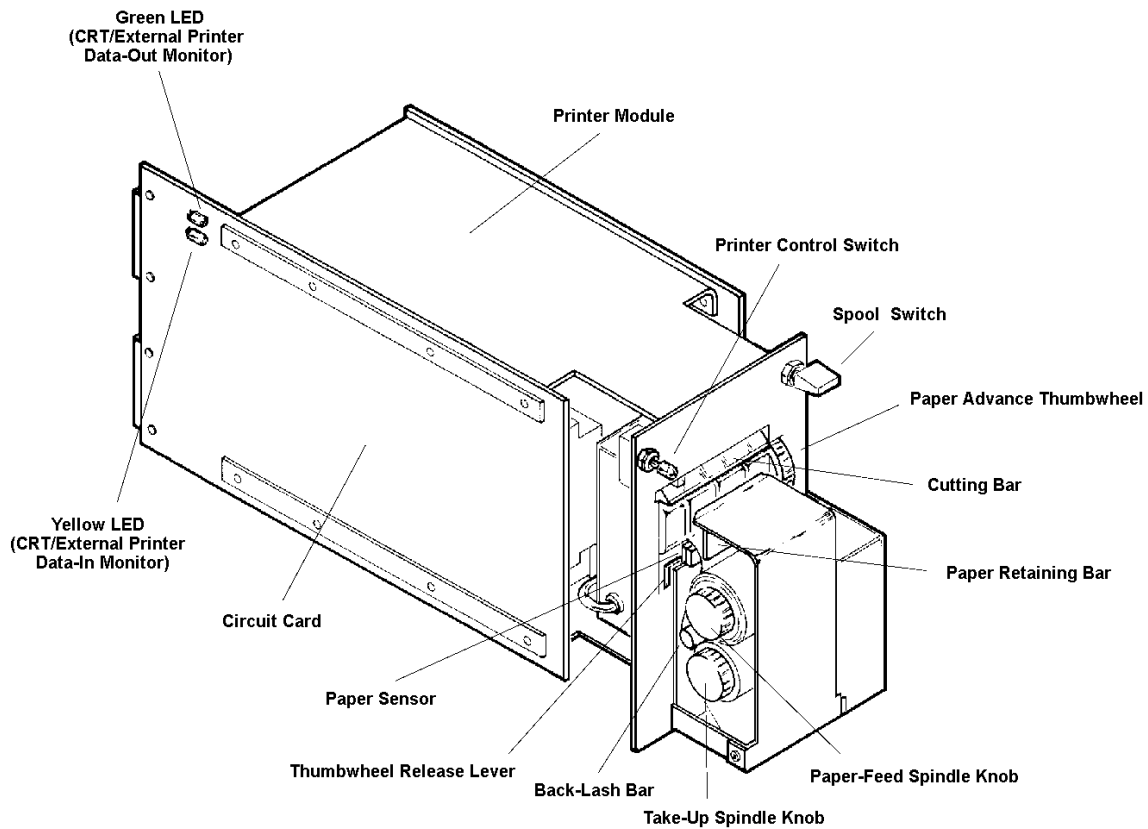
Figure 8-1: Printer Module (front view) (D6550)
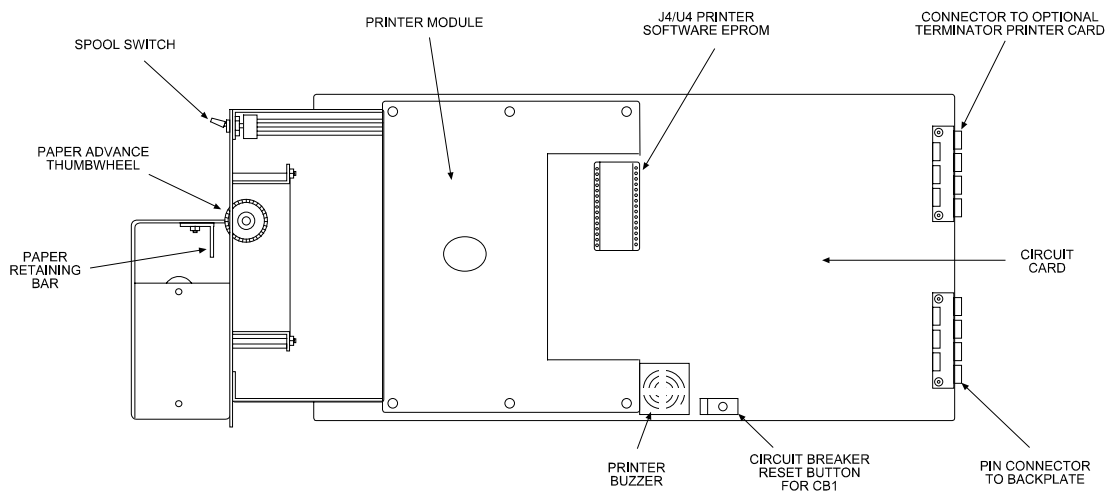

Figure 8-2: Printer Module (side view)

8.1 Description

Printer Module (D6550)

Caution: *If it is ever necessary to return the Printer Module to Radionics for repair, it MUST be packaged carefully. Excessive stress placed on the printed circuit board may cause hairline fractures in the board, making it non-repairable.*

Circuit Breaker Reset Button: Resets the circuit breaker (CB1) (-26V supply) for stalled print head.

Connection to Backplane: This connection provides interface between the Printer Module and the MPU Card for printing requests.

Connection to Optional Printer Terminator Card: The Printer Module is plugged into the Printer Terminator Card, through the backplane, using this connection. The Printer Module, together with the printer terminator card, allows reports to be sent to the external printer as programmed.

Cutting Bar: For cutting the internal printer paper.

Data-In Monitor: (DS1, Yellow LED) RS232 Data-In Monitor for an external printer or Auxiliary CRT (on solder side of board).

Data-Out Monitor: (DS2, Green LED) RS232 Data-Out Monitor for an external printer or Auxiliary CRT (on solder side of board).

Paper Advance Thumbwheel: Use the thumbwheel (located on the right side of the front of the printer) to manually feed the paper through the printer.

Paper-Feed Spindle Knob: Holds the paper roll on the Paper Feed Roll.

Paper Retaining Bar: Holds the paper against the paper sensor contacts.

Paper Sensor: The paper sensor is four copper-clad strips attached to the front of the printer just under the paper input slot. Two strips are ground and two strips work as the paper sensor. If a message is received, it is displayed on the LCD and printed out on the internal printer. If the paper fails to make contact with the paper sensor and ground, the printer will attempt to print the message. If paper is not sensed, the D6500 generates a line feed and checks again to see if paper is sensed. If paper is sensed, the D6500 resumes normal operation (refer to the *Computer Interface Manual* for operations using specific programming options).

The writing platen on the Paper Take-up Spool assembly must be fully closed to hold the paper against the Paper Sensor (see Section 8.4 for instructions on changing the printer paper).

Paper Take-up Spool: The Paper Take-up Spool is a built-in feature of the D6500. When the Spool Switch is in the AUTO position the Paper Take-up Spool automatically spools the printer paper as messages are printed. The Paper Take-up Spool assembly also provides a convenient writing platen.

Printer Buzzer: Sounds when the circuit breaker trips.

Printer Control Switch: This switch controls the flow of data to the printer (it is NOT a power switch). In the Up position the printer is able to receive data, in the Down position the printer is disabled. To change position of the switch, you must first pull it away from the faceplate and then place it in the desired position.

Spool Switch: In the Up (Off) position, the automatic paper take-up spool is disabled. In the Middle (AUTO) position the paper take-up spool operates automatically and spools the paper as messages are printed. In the Down (MAN) position, the spool motor is activated to take-up any slack in the paper.

Take-Up Spindle Knob: Holds the paper spool on the Paper Take-Up Spool.

Thumbwheel Release Lever: This lever (located on the lower left front of the printer) releases the pressure on the printer paper, so you may remove paper or thread new paper into the printer.

8.2 Module Removal and Replacement

Caution: *The D6500 must be powered down before removing or replacing the Printer Module (D6550).* Touch the receiver's frame before handling any circuit card to discharge static electricity from your body.

Removing the Printer Module

1. **Power down the receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Loosen the screws at the top of the Printer Module.

3. Grasp the lower edge of the Writing Platen/Paper Take-Up Spool assembly and slowly pull the Printer module out of the receiver's enclosure.

Replacing the Printer Module

1. **Power down the receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Remove the defective printer as described above.

3. Align the top and bottom of the Printer Module circuit card with the card guides in the printer compartment. Slide the Printer into the compartment.

4. Tighten the screws at the top of the Printer Module. Power-up the receiver.

5. Make sure the Printer Control Switch is in the ON position. Press the TEST button, on the front of the MPU Card, to initiate a printer test.

6. Power up the receiver by simultaneously switching on the AC and BAT switches on the power supply card.

Printer Terminator Card (D6555)

The D6555 is an *optional* terminator card that provides an RS232 output for connection to an external printer or CRT.
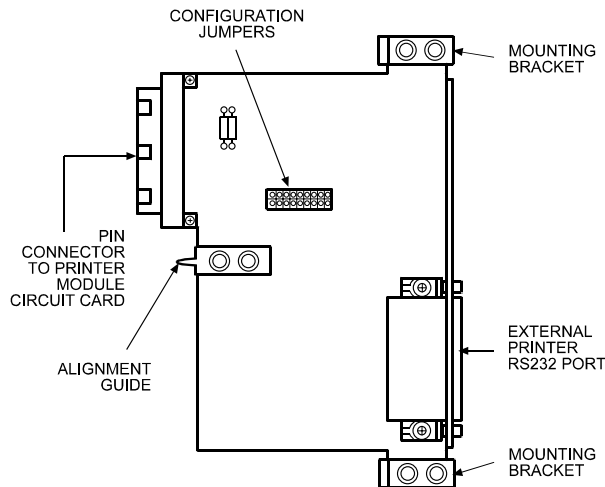
Figure 8-3: The printer terminator card

Alignment Guide: Provides connection stability and acts as a guide when connecting the terminator card to the Printer Circuit Card.

Configuration Jumpers: (J3) Lets you set up the RS-232 Data I/O protocols for the external device (Printer or CRT) to be connected to the D6555 (see Figure 8-4).

Header pins R and P are used for configuring the RS-232 Data I/O protocols for a CRT (set the R and P jumpers in the *horizontal* position when using a printer).

Header pins M, K, J, H, and F are used for an external printer configuration.

Pin 7 in the 25-pin RS-232 connector is always grounded. Additional grounding connections between the D6500 receiver and the external printer are not necessary.

External Printer/CRT RS232 Port: Provides data-out capability *only*. Used to connect to an external Printer or CRT.

Mounting Brackets: Connects the terminator card to the D6500 chassis and provides chassis/earth grounding.

Pin Connector to Printer Module Circuit Card: Provides direct interface between the terminator card and the Printer Circuit Card.
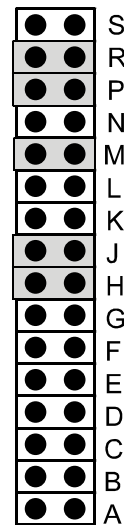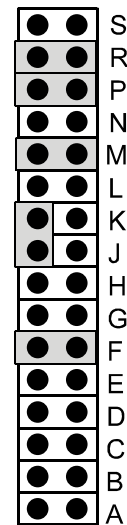
Figure 8-4: D6555 Jumper J3

8.3 Card Installation

The D6500 must be powered down before installing the Printer Terminator Card (D6555). Touch the receiver's frame before handling any circuit card to discharge static electricity from your body.

Installing the Printer Terminator Card

1. **Power down the receiver** (see Section 9.6, *Powering Down the Receiver*).

2. Remove the rear panel from the D6500 Receiver. Gently pry off and discard the plastic rectangular cover plate labeled CRT RS-232.

3. Align the top and bottom edges of the Printer Terminator Card with the card cage guides of the extreme left-hand card slot (behind the internal Printer Module circuit card.

4. Slide the D6555 Circuit Card into its card slot until the metal alignment guide pin is inserted into the mating alignment hole in the D6500 backplane circuit board (system power and data bus).

5. Secure the Mounting Brackets at the top and bottom corners of the Terminator Card to the upper and lower mounting rails inside the D6500 cabinet. *Make sure the screws are firmly tightened–the screws provide the ground connection required for reliable receiver operation.*

6. Re-install the rear panel of the receiver and secure it in place with the four mounting screws, one in each corner.

8.4 Changing the Internal Printer Paper

The Internal Printer in the D6500 receiver uses a special electro-conductive paper to record data. Use only Radionics D6007 Printer Paper. The Internal Printer has a copper paper sensor which makes contact with the shiny side of the electro-conductive paper. The Internal Printer shuts off when the Paper Sensor does not make contact with the paper. If other reporting devices are functioning, a message indicating the failed device is printed/displayed if Internal Printer Supervision (*Supervision*) is enabled (see the *D6500 Program Entry Guide*). If the internal printer is the only reporting device and it shuts off, the receiver switches to the Manual Mode of operation. The status line of the LCD will display **Check Internal Printer**.

NOTE: The take-up spool writing platen is secured to the printer module by a hinge on its lower edge. The writing platen is held in position by a spring latch. To access the paper spindles you must pull the top of the writing platen away from the front of the receiver.

Changing the Paper

1. *Set the Printer Control Switch to the **OFF** position.* Gently pull the switch away from the face of the receiver then place the switch in the OFF position (down).

2. *Feed the last few inches of paper through the printer.* Rotate the thumbwheel (using a downward stroke) until the end of the paper comes out of the printer. [If the thumbwheel does not work, push up the black plastic lever on the left side of the printer (Release Lever) and manually pull the paper out of the printer.]

   NOTE*: Always use the thumbwheel to advance the paper – do NOT pull the paper.*

3. *Remove the empty paper core from the paper feed spindle on the printer.* Turn the spindle knob counter-clockwise until it is free from the spindle. Slide the empty paper core off of the spindle. *Save the empty paper core* — you will re-install it on the take-up spindle to provide a core for the next roll of paper.

4. *Put a new roll of electro-conductive paper on the paper feed spindle.* Make sure that the paper is positioned so the shiny side faces the Paper Sensor when the paper is threaded into the printer. Put the knob back on the paper feed spindle. Rotate the knob clockwise to tighten it.

5. *Thread the paper into the printer.* Run the paper off the front of the paper feed roll and around the bottom of the back lash bar, then up and over the Paper Sensor and into the lower slot of the printer (see Figure 8-5). *Advance the paper with the Paper Advance Thumbwheel (using a downward stroke) until the paper comes out the top of the printer.* If the thumbwheel does not work, push up the black plastic Thumbwheel Release Lever on the left side of the printer so you can thread the paper into the printer.
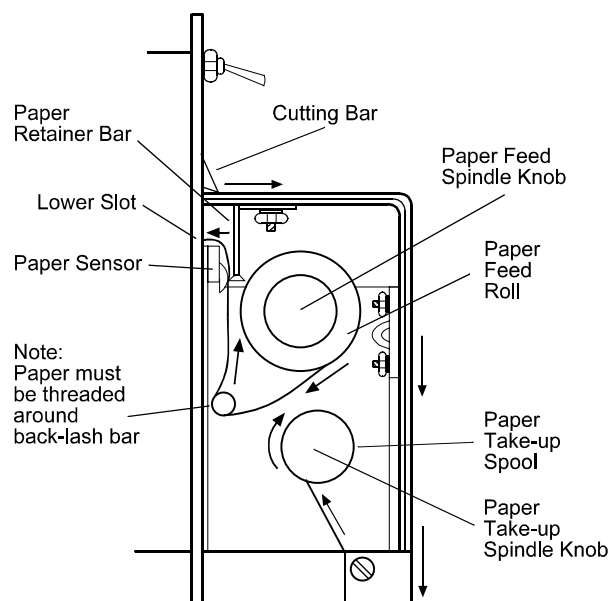
Figure 8-5: Changing the Internal Printer Paper

6. *Your receiver is equipped with a Paper Take-up Spool.* It automatically rewinds the printed copy of the receiver activity reports. Remove the roll of used paper from the Paper Take-up Spool and "start" the new roll.

   a. Hold the center of the Take-Up Spindle. Turn the knob counter-clockwise to remove it from the spindle.

   b. Firmly grasp the old roll of used paper and pull it off of the spindle.

   c. Slide an empty paper core (see step 3) onto the take-up spindle.

d. Secure the end of the new paper roll to the paper core on the take-up spindle (use adhesive tape).

e. Put the Spindle Knob back onto the Take-Up Spindle. Hold the center of the Take-Up Spindle and rotate the knob clockwise to tighten it.

f. Return the writing platen to its normal position, making sure the magnet latches the platen in place.

7. *Set the Printer Control Switch to the "ON" position.* Gently pull the switch away from the face of the receiver, lift it upward. Release the switch lever when it is in the ON (up) position.

8. *Test the printer.* Press the TEST button on the front of the MPU Card. The printer should print the following test message:

```
MM/DD HH:MM L8 ACCT  888 [TEST]   ZN   8
(MM/DD is the date, HH:MM is the time.)
```

Troubleshooting

If the printer doesn't work after the paper has been changed:

1. *Make sure the Printer Control Switch is in the "ON" position (UP).*

2. *Make sure that the shiny side of the paper makes good contact with the paper sensor.* If the writing platen is not fully closed, the paper may not make proper contact with the sensor. Press the writing platen toward the front of the receiver and make sure the catch holds the platen in place.

3. *Check for paper jams:* NEVER pull the paper down or sideways, this could cause a jam.

a. Change the Printer Control switch to the "OFF" (down) position.

b. Remove the plastic paper cutting bar by gently pushing it to the left and pulling it toward you.

c. Press the Release Lever to relieve pressure on the paper.

d. Remove jammed paper — Use a can of DRY compressed air (available from photographic supply houses) to blow dust and scraps of paper from the printer.

Caution: *Do not use paper clips or other metallic instruments to remove jammed paper. Do not use ordinary compressed air—moisture in it could damage the printer circuits.*

CAUTION

e. Gently snap the cutting bar into place after the jam is cleared and turn the Printer Control switch "ON."

8.5 External Printers Supported

An external printer can be connected to the RS-232 port with a 25-pin serial cable (maximum 50 feet). The external printer can operate in a supervised or unsupervised mode. The unsupervised mode is provided for use with printers that cannot supply the DTR handshake signal or hardware supervision. If the printer supplies XON/XOFF, the printer is supervised for paper out and online/offline conditions. In unsupervised mode, the cable between the receiver and the printer and the condition of AC power loss are not supervised.

In supervised mode, printer trouble is reported for printer offline, loss of AC power, paper out, and disconnected cable. The supervised mode must be used for UL installations. The D6500 receiver supports the following printers in supervised mode.

Epson LQ510/LX810 with serial option #8143

The LQ510/LX810 DIP switches should be set for the proper parity, baud rate, etc. Set LQ510/LX810 jumpers as follows:

J5	OFF (Do not pull up DSR and CD to +12V.)
JRS	ON (Select RS-232.)
JC	OFF (Do not select current loop.)
JNOR	ON (DTR = low when deselected.)

Okidata ML172/ML182T Serial

Configure the ML172/ML182T switches as follows:

Switch Bank 1

1	Parity		as per D6500 MPU program
2	Parity		as per D6500 MPU program
3	Data Bits		as per D6500 MPU program
4	Protocol	ON	Ready/Busy
5	Test Select	ON	Circuit
6	Mode Select	ON	Print
7	Busy Line Sel	ON	DTR pin 20
8	Busy Line Sel	ON	DTR pin 20

Switch Bank 2

1	Baud Rate		as per D6500 MPU program
2	Baud Rate		as per D6500 MPU program
3	Baud Rate		as per D6500 MPU program
4	DSR Input	ON	Active
5	Buffer Thresh.	ON	32 bytes
6	Busy Signal	ON	200 ms
7	not used		
8	not used		

Okidata ML320 Serial

Configure the ML320 as follows:

Parityas	per D6500 MPU program
Serial Data 7 or 8 bits	as per D6500 MPU program
Protocol	Ready/Busy
Diagnostic Test	No
Busy Line	DTR
Baud Rate	as per D6500 MPU program
DSR Signal	Valid
DTR Signal	Ready on Power Up
Print Mode	Utility
Busy Time	200 ms

8.6 External Printer Reports

A sample external printer report is shown in Figure 8-6. The sequence of reports from the external printer are oldest at top and newest at bottom, whereas reports from the D6500 *internal* printer read from bottom (oldest) to top (newest).

```
Oldest Report
07/29    13:20    L2    ACCT    812    CLOSING      ZONE B
07/29    13:21    L2    ACCT    812    ALARM        ZONE 1
07/29    13:22    L2    ACCT    812    RESTORAL     ZONE 1
07/29    13:22    L2    ACCT    812    CANCEL       REPORT
07/29    13:22    L2    ACCT    812    OPENING      ZONE B
07/29    13:22    L2    ACCT    812    TROUBLE      ZONE F
07/29    13:23    L2    ACCT    812    RESTORAL     ZONE F
Newest Report
```

Figure 8-6: EXTERNAL PRINTER REPORTS

9. Installation

9.1 UL Installations

Radionics has always taken the position that in the central station environment a spares package or redundant receiver was a necessity to ensure optimum central station protection.

WARNING: *However, Underwriters' Laboratories (UL) Standard 611 paragraph 28.1, requires that any central station listed for NFPA 71.5, Burglary or Central Station Protective Signaling, must have a redundant receiver on premises to be used in the event that the primary receiver fails or malfunctions.*

One spare receiver may serve as a backup for a maximum of five active receivers.

UL Standard 611 paragraph 28.1 also states that you must be able to switch from one receiver to a stand by receiver within 30 seconds, and repair the faulty receiver and return it to service within 30 minutes (this requires a D6500 spares package).

While it is perfectly acceptable to back up a D6000 with a D6500, there are certain situations where incompatibilities will arise when backing up the D6500 with the D6000. When using Modem or 3x2, 4x1, and 4x2 pulse formats, it is impossible to use the D6000 to back up the D6500. The D6000, in all cases, is only capable of reporting ten zones of alarm, trouble, and restoral information and can only support three digit account numbers and one digit zone #'s.

To satisfy this requirement, it is Radionics policy to recommend the use of a D6500 receiver as a back up if the primary receivers are D6500s. Use of four digit account numbers (communicating in a Radionics Modem format) or reporting ZONEX or COMEX requires a D6500 receiver for redundancy.

If you have any questions, please call Radionics Technical Support or your regional manager.

9.2 Burglar Alarm Applications

The D6500 Receiver is intended to be installed in accordance with UL Standard 611 for Central Station Burglar Alarm Systems and/or UL Standard 365 Police Station Burglar Alarm Systems. To supervise certificated accounts this receiver must be used in a central station which has backup AC power in compliance with NFPA 71. The internal batteries do not provide sufficient operating time to comply with the referenced standards. Terminals for connection of an external DC power supply are provided in the rear of the receiver (see Section 10).

9.3 Fire Alarm Applications

The D6500 Receiver is suitable for Central Station Protective Signaling when it is installed and used in compliance with NFPA Standard No. 71 or NFPA 72 (chap. 8) and ANSI/NFPA 70-1984 Article 760. Installation limits for Digital Alarm Communicator Receivers (DACR) are under the jurisdiction of your local authority.

9.4 Installation Check List

[ ] 1.   The D6500 Receiver is shipped with a 16 VAC Class 2 transformer (D1650), two 12 VDC, 7 Ah batteries (D126) and rack mount hardware.

[ ] 2.   Open the door of the display panel and locate the Power Supply Card. Make sure that the **AC** and the **BAT** power switches on the right side of the Power Supply Card are **OFF** (both switches in the down position, see Figure 9-1).

[ ] 3.   Check each of the receiver's cards to see that they are properly positioned in the card guides at the top and bottom of the enclosure and that the connections have not become loose in shipment.

[ ] 4.   Loosen the screws at each corner of the rear panel. Remove the rear panel from the receiver.

[ ] 5.   Connect a grounding wire to the threaded Earth Ground post on the receiver cabinet frame near the Power Supply terminator card (see Figure 9-2). The grounding wire should be 16 AWG or heavier. Secure the wire to the post using the washer and nut provided. Run the grounding wire through the **EARTH GND** cut-out on the receiver's rear panel. Secure the grounding wire to a good earth ground (see section 22. Central Station Tips for details on proper grounding of the D6500).

[ ] 6.   There are four screw terminals on the Power Supply terminator card (see Figure 9-2). Make the appropriate connections to these terminals as outlined below:

   a.   Terminals 1 (- negative) and 2 (+ positive) on the Power Supply terminator card allow the receiver to be connected to an external D.C. power supply (see section 10 Standby Power). If you will be using an external D.C. power supply for emergency standby power, run the connecting wires through the **EXT BAT** cutout on the receiver's rear panel when you install the receiver.

   b.   Terminals 3 and 4 on the Power Supply Terminator Card provide a dry contact relay output which is closed while the operator alert buzzer is activated (see section 10, Standby Power). If you are connecting the relay output

to an external device, run the wires through the **EXT BUZ** cutout on the receiver's rear panel.
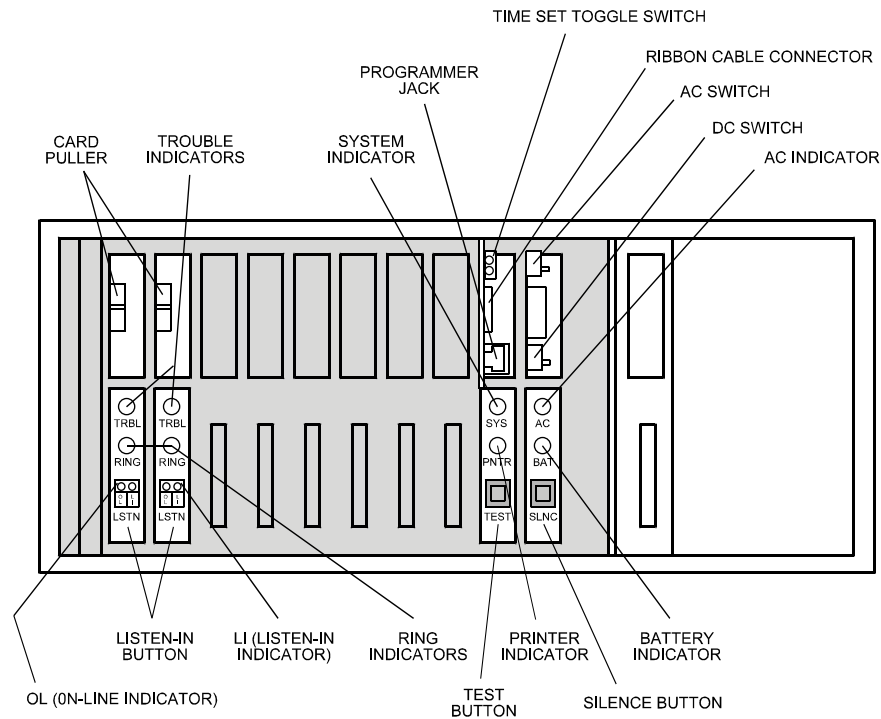

Figure 9-1: D6500 receiver front section controls and indicators (display door open)
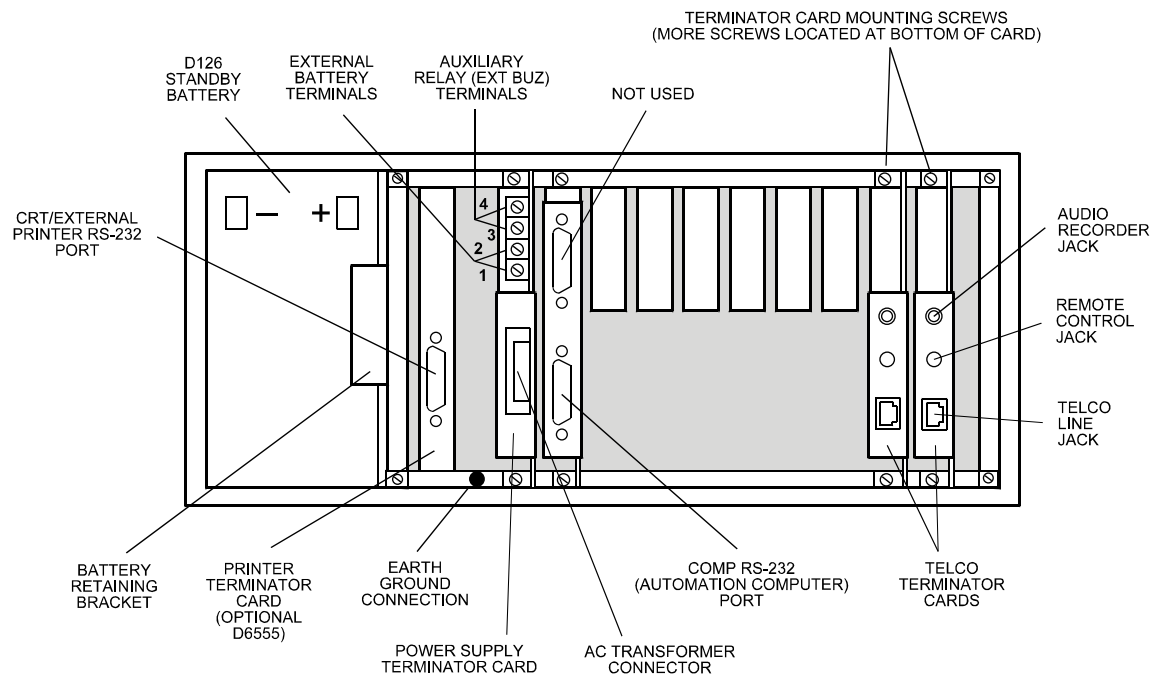

Figure 9-2: D6500 receiver, rear view (rear panel open)

[ ] 7.   Install the two D126 Standby Batteries in the receiver. A Battery Retaining Bracket is installed at the back of the battery compartment. Loosen the screws at the top and bottom of the bracket to remove it from the enclosure.

a. Connect the *black* battery leads from the Power Supply Terminator Card to the *black* terminals on the batteries.

b. Connect the *red* battery leads from the Power Supply Terminator Card to the *red* terminals on the batteries.

c. Turn one of the batteries on end so that the terminals are near the top of the battery. With the terminals facing the *front* of the receiver, slide the battery into the battery slot (see Figure 4-2).

d. Turn the other battery on end so that the terminals are near the top of the battery. With the terminals facing the *rear* of the receiver, slide the battery into the battery slot (see Figure 4-2).

e. Re-install the Battery Retaining Bracket.

[ ] 8. The D6500 receiver comes equipped with two D6540 or D6541 Digital Telephone line cards and two D6545 Digital Telco Terminator Cards. If you are going to install *additional* line cards, install the terminator cards now.

[ ] 9. If you installed additional Line terminator cards (in step 8 above) you can now install the line cards (see Section 5.2).

[ ] 10. You may also want to install the Line terminator card(s) from your Spares Package(s) so that in the event of a failure, you may quickly switch over to the replacement card. (See Section 5.2 for the installation procedure.)

NOTE: You may install "spare" Line terminator cards, however **do not install "spare" line cards** (see Section 22, Central Station Tips).

[ ] 11. Connect 4 or 6 conductor phone cord(s) to the RJ11C jack(s) of the desired phone line(s). Plug the other end of the modular phone cord(s) into the TELCO Jack on the appropriate line terminator card(s).

[ ] 12. Plug the Transformer's Power Connector plug into the "POWER 16.5 VAC 50VA 60 Hz" socket on the back of the receiver. Plug the transformer into a properly wired 120VAC 60 HZ outlet (Standard AC outlet). Make sure the outlet is not controlled by a switch!

[ ] 13. Simultaneously switch the AC and BAT slide switches on the Power Supply card ON (to the "up" position).

NOTE: If Battery Missing or Battery Trouble is reported when you power up, allow the receiver to operate on AC power for several hours to recharge the batteries before troubleshooting a low battery condition.

[ ] 14. Perform a "Manual System Test" to ensure that all connections are secure and that all

components are operating properly (see Section 13 for instructions).

[ ] 15. Load your customized 6500:MPU and 6500:LINE Programs into the receiver (see Section 12 for details).

[ ] 16. Set the Calendar and Clock to the correct date and time (see Section 11). Close the display door.

[ ] 17. To ensure that communication formats are correct, test the receiver by having communicators transmit reports to each line connected to the receiver.

9.5 Rack Mount Instructions

Rack mounting hardware is included with the D6500. When mounted in a rack, the receiver's Class 2 transformer may be plugged into an outlet inside the rack *only if* the outlet is wired in accordance with Article 760 of the National Electrical Code. **Underwriters' Laboratories specifications require that the receiver be wired by trained commercial professionals and connected through a transformer directly into a 120VAC 60 Hz electrical supply. DO NOT connect the D6500 to an outlet that is controlled by a switch.**

[ ] 1. The side panels are secured to the enclosure frame with Velcro™ fasteners. Insert a flat-bladed screwdriver in the slot on the rear edge of the receiver side panel and pry each of the panels off.

[ ] 2. On each side of the frame (near the front edge) are two threaded holes. Align the holes in the rack mount "ears" with the holes in the receiver cabinet frame. Use the screws provided to secure the ears to the receiver.

[ ] 3. A shelf or bracket MUST be installed at the back of the rack to support the receiver.

CAUTION

Caution: *The front mounting ears CANNOT support the full weight of the D6500. A support shelf or bracket <u>must</u> be installed.*

9.6 Powering Down the Receiver

The D6500 must be powered down before installing, removing, or replacing components.

NOTE*:* Incoming calls illuminate the RING indicator on the line card, even when the receiver is powered down.

1. Open the front of the receiver.

2. Remove battery power: Slide the BAT switch on the Power Supply Card to the OFF (down) position.

3. Remove AC power: Slide the AC slide switch on the Power Supply Card to the OFF (down) position.

4. Unplug the AC transformer from the 120 volt outlet.

To power up the receiver after installing or replacing components, follow steps 12 through 17 in section 9.4, *Installation Checklist*.

10. Standby Power

During loss of AC power, the receiver automatically switches to standby power supplied by two D126 Standby batteries. As long as there is adequate standby power available from the D126 batteries, there is no interruption of the receiver's operation even if the power loss occurs during signal processing. When power supervision is enabled in the 6500:MPU program (program item *Power Supv Rpts*), the primary reporting devices print AC TROUBLED, the D6500's AC indicator starts blinking and the receiver display becomes backlighted when the receiver begins to operate on standby power. When AC power is restored, the AC indicator comes on, the display backlight goes out, and reporting devices show AC RESTORED.

10.1 Battery Description and Specifications

Standby power is supplied by two D126 rechargeable sealed lead-acid batteries. The actual amount of standby time available is determined by the activity of the receiver and the age of the batteries. (See Section 3 for Current Requirements.) The D126 batteries should be replaced every three to five years as the battery capacity is depleted with age. Batteries charged to full capacity provide 4 hours of standby power. When the available standby power reaches 11.7 to 12 VDC the BAT (battery) LED lights and a LOW BATTERY message is sent to the primary reporting device(s). The LOW BATTERY message prints at approximately 60 minute intervals and the LED remains lit until the batteries are re-charged to 13.2 VDC. When the battery power drops below 11.0 volts the internal printer may not work properly: it may begin to print slower than normal, the print quality will be reduced, and the print head will eventually stall.

10.2 Replacing the D126 Batteries

1. Open the display door of the receiver. Turn off the DC Switch on the Power Supply Card.

2. Remove the Backplate from the receiver.

3. The batteries are located in the battery compartment at the left side of the receiver. A bracket holds the batteries securely inside the compartment. Two screws attach the bracket to the mounting rails at the top and bottom of the bracket. Remove the screws and the battery bracket and put them in a safe place.

4. Remove the red and the black battery leads from the first battery. Remove the battery from the receiver.

5. The second D126 battery can now be seen inside the receiver's battery compartment. Grasp the battery and carefully slide it out of the battery compartment, making sure you do not pinch the battery leads between circuit cards or other hardware in the receiver.

6. Remove the red and the black battery leads from the battery.

7. Connect one of the black battery leads to the black terminal on one of the new batteries. Connect one of the red battery leads to the red terminal on the new battery.

8. Turn the battery on end so that the terminals are near the top of the battery. With the terminals facing the front of the receiver, slowly slide the battery into the battery compartment. Do not pinch the battery leads!

9. Connect the remaining black battery lead to the black terminal on the other new battery. Connect the remaining red battery lead to the red terminal on the battery.

10. Turn the battery on end so that the terminals are near the top of the battery. With the terminals facing the rear of the receiver, slowly slide the battery into the battery compartment.

11. Re-install the battery bracket. Secure the bracket to the mounting rails on the receiver using the two screws and washers provided. (Screw specification: pan head Phillips, 4-40 x 3/8". Washer specification: internal tooth #4.) Replace the receiver's backplate.

12. Return the DC Switch on the Power Supply Card to the On (up) position. Close the display door.

10.3 Connection to an External DC Power Source

CAUTION

Caution: *Do not connect an external battery charger to the D6500. Do not charge the external batteries while they are connected to the D6500. Connection of an external power source with a terminal voltage of 14.3V or greater will damage the internal batteries.*

Terminals on the back of the Power Supply Terminator Card allow you to connect to an external DC power source. The terminals are not part of a charging circuit; the external source cannot be used to charge the internal batteries and the D6500 does not charge the external source. During AC power outages, the external DC source begins supplying power to the receiver to supplement the power available from the internal batteries. A 12VDC lead-acid battery or two 6VDC batteries wired in series can be used for external back-up power. Use only approved stationary standby batteries for UL applications.

For your convenience, Radionics recommends installation of a double-throw, double-pole switch to control the connections between the charger, external battery and D6500. Install the switch in the external battery circuit as shown in Figure 10-1. OBSERVE POLARITY!

With the switch in the normal position the external battery is connected to the battery charger. When the switch is thrown (e.g.: during AC power failure/low battery condition) the battery charger is taken out of the circuit and the external battery is connected to the D6500.
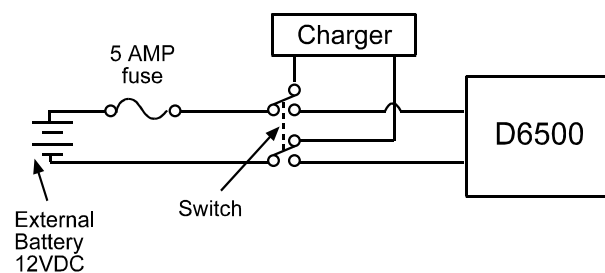
Figure 10-1: External Battery Connection

11. Clock and Calendar Controls

The D6500 receiver uses a 24 hour clock format and a 365 day standard calendar year program. The calendar automatically changes the month number at the end of each month. The clock and calendar will have to be adjusted when the unit is initially installed and whenever all power to the unit has been interrupted. The clock must be manually adjusted for changes from Standard Time to Daylight Saving Time and vice-versa.

1:00pm =	13:00
2:00pm =	14:00
3:00pm =	15:00
4:00pm =	16:00
5:00pm =	17:00
6:00pm =	18:00
7:00pm =	19:00
8:00pm =	20:00
9:00pm =	21:00
10:00pm =	22:00
11:00pm =	23:00
12:00am =	00:00

Figure 11-1: 24 Hour clock settings

Setting the Time and Date on the D6500

(6500:MPU Program item *Time Set Enable* must be programmed **Yes** to enable this function.)

1. Open the front panel door.

2. Locate the TIME SET toggle switch near the top of the MPU Card. Toggle the switch down and then up again to activate the "SET TIME" display. The operator alert buzzer sounds and continues to sound until the Time Set mode is terminated.

    At the right side of the display you will see "`00/00/00 00:00`". The format appears as `MM/DD/YY HH:MM`. **The flashing digit shown in the display can now be adjusted.**

3. Press the "TEST" button on the MPU Card to increment the flashing digit shown in the display. When the digit reflects the correct "tens" digit of the **month** number, toggle the TIME SET switch down and then up again to advance to the next digit. The next digit is the "ones" digit of the month number, then a slash. The **day** of the month digits followed by another slash and then the **year** digits to complete the date. Although the year is entered, it is not displayed on any messages. The **hour** and **minute** digits follow and are separated by a colon.

4. The next digit to be adjusted begins to flash. Press the "TEST" button on the MPU Card to increment the flashing digit. When the digit reflects the correct "ones" digit of the month number, toggle the TIME SET switch down and then up again to advance to the next digit.

5. Repeat steps 2 through 4 to set the correct day of the month.

12. Programming the D6500 Receiver

WARNING: *The Programming Mode should not be initiated while the receiver is occupied with signal processing. The D6500 display will show* "RECEIVER BUSY:#" *to indicate that a signal is being processed, and the Line number (#) receiving the signal. Monitoring service should be switched to a back-up receiver before attempting to edit the primary receivers program. After the Programming Mode is entered, the D6500 cannot answer incoming calls. If an incoming call is detected, the line card RING indicator will light.*

The D6500 Receiver is shipped with standard programs already installed. The standard programs consist of the default settings shown in the D6500 Program Entry Guide. You can create customized programs using the D5200 Programmer. The programmer must be loaded with the 6500:MPU and 6500:LINE Product Handler Programs. Descriptions of the program items are found in the Program Entry Guides.

Many of the operational features of the D6500 can be altered through programming options. The programming options you choose will depend on the type(s) of peripheral reporting device(s) used in your central station (e.g. external printer, auxiliary CRT or automation computer), the supervision characteristics for these devices, the type of communicators reporting to the receiver, and the number and type of receiving lines in use.

12.1 Loading Customized Programs into the Receiver

1. Create appropriate 6500:MPU and 6500:LINE programs for your D6500 receiver. Name and save each of the files in the D5200 programmer.

2. Open the receiver's display door and locate the MPU Card (see Figure 4-2).

3. Plug the D5200's data/power cord into the Programmer Jack located on the MPU Card (see Figure 6-1).

4. Advance the D5200's cursor to the *6500* handler , and press the **ENTER GROUP** button.

5. Simultaneously press the SLNC and TEST buttons on the front of the D6500. The D6500's display shows the message: Prog: Programmer ready when the receiver is ready to be loaded.

NOTE: If the display does *not* indicate "PROGRAMMER READY" within 20 seconds of pushing the TEST and SLNC buttons, the display momentarily shows

"Prog: CHECK PROGRAMMER"

and the Programming Mode is terminated. Make sure the programmer is plugged in properly and you have entered the *6500* Product Handler, then repeat step 5.

6. Advance the programmer's cursor to the appropriate program file name and press the **ENTER GROUP** button. The first program item appears in the programmer's display.

7. Press the **SEND (LOAD)** button on the programmer. When loading a 6500:LINE program, you must enter the number of the line card you are programming, after you press the **SEND (LOAD)** button The D5200's display shows: " Load to 6500" momentarily then shows the first item of the program you have just loaded.

8. Press the **EXIT GROUP** button until *D5200 PROGRAMMER* appears in the programmer's display.

9. Unplug the programmer's data/power cord. Approximately 20 seconds after the programmer is disconnected, primary reporting devices will print messages indicating the time the Programming Mode was initiated:

   00/00 HH:MM PROGRAM MODE IN RCVR ##

   and the time it was terminated:

   00/00 HH:MM PROGRAM MODE OUT RCVR ##

NOTE: Simultaneously pressing the SLNC and TEST buttons also terminates the programming session. The programmer cord can be unplugged before or after terminating the session in this manner.

12.2 Editing Programs

When you are ready to re-program the D6500 to change the operating parameters or add new features to your receiving system, you only need to edit the file affected by the changes.

ALWAYS NAME AND SAVE the new program files in the D5200 Programmer so that in the event that the programs must be re-loaded into the receiver the most current programs will be readily available.

13. Program Default Initialization Routine

The Program Default Initialization Routine clears all memory buffers and customized 6500:MPU and 6500:LINE programs from the D6500 Receiver. When this routine is initiated, all of the receiver's programs return to the original default settings as shipped from the factory. The time and date must be set and the custom MPU and LINE programs must be reloaded after this routine is completed. To initiate this routine:

1. Put the DC slide switches in the OFF (down) position, then put the AC slide switches in the OFF (down) position.

2. Put the TIME SET toggle switch in the time-set (down) position.

3. Simultaneously put the AC and DC slide switches in the ON (up) position.

4. Return the TIME SET toggle switch to the normal (up) position.

5. After the Cards have been given enough time to initialize, set the time and date (see Section 11).

14. D6500 Operation

14.1 How Messages are Transmitted

Digital Communicators: Digital Communicators (also known as digital dialers) use the switched telephone network to transmit alarm and supervisory signals from one location (protected premises) to another location (central station). Digital communicators use the same telephone network as ordinary dial or Touch-Tone™ (DTMF) telephones. This signal path can be within one building (proprietary system) or across the nation. Digital communicators can be used anywhere you can dial direct to the receiver without an operator's assistance.

FCC Regulations: Digital communicators must be registered with the Federal Communications Commission and an approved coupler must be used to connect it to the switched telephone network (per FCC regulations Part 68). It is a violation of FCC regulations to connect a communicator to a pay phone or party line. Radionics' communicators are registered with the FCC and use an RJ31X or an RJ38X jack for connection to the telephone network. (An RJ31X jack provides line seizure capability. An RJ38X provides both line seizure and telephone cord supervision capability.) The D6500 Security Receiver is also registered with the FCC and uses an RJ11C jack for connection to the telephone line.

Line Seizure: When the communicator changes state (e.g. from normal to alarm, trouble to normal, etc.), it goes "off-hook" and seizes the telephone line. When the RJ31X (or RJ38X) is properly wired, "line seizure" prevents anyone from using the telephone when the communicator has a message to transmit. If someone is using the telephone when the communicator seizes the line, the original conversation is disconnected if the jack is properly wired. The communicator places a 600 ohm load across the line's tip and ring to initiate dial tone. After detecting the dial tone the communicator dials the central station receiver's telephone number. (Some telephone lines require a momentary short to ground to initiate dial tone. These are called "ground start" systems. The communicator may require additional equipment or programming to initiate dial tone on a ground start system.)

Receiver Acknowledgment: A line card in the D6500 Security Receiver is connected to the telephone line dialed by the communicator. The line card detects ringing voltage, answers the incoming call, and sends a programmed series of "acknowledgment" tones. *If the acknowledgment tone expected by the communicator is not transmitted by the receiver or not heard by the communicator, the communicator will not transmit its message.*

The acknowledgment tone is used for two purposes. These two purposes are commonly called "handshake" and "kiss-off". The *handshake* is sent over the telephone line when the D6500 answers the incoming line. The handshake tells the communicator that it has reached the central station and the receiver is ready to accept data. The *kiss-off* is transmitted by the receiver after the communicator's message has been received and understood by the D6500. The acknowledgment tone's frequency is usually the same for both the handshake and kiss-off (Radionics Modem II format Ack tone has an inverted kiss-off).

Each line card installed in the D6500 receiver can transmit 2300Hz, 1400Hz, Radionics Modem II, Radionics Modem IIe/IIIa2 *and* the Dual Tone acknowledgment tones. The receiver can be programmed for up to six acknowledgment attempts, using any combination of the available acknowledgment tones. This allows communicators using different tones to report to the same incoming line. The 6500:LINE Product Handler program is used to select the acknowledgment tones and sequence in which they are transmitted by each line card.

When the communicator hears the handshake tone, it sends an account code and the alarm zone information. The D6500 Receiver displays and prints messages by zone for communicators capable of transmitting the proper format. Radionics communicators can be programmed to transmit a variety of English language messages such as: TROUBLE, RESTORAL, OPENING, CLOSING, LISTEN-IN, and other supplementary messages.

Message Verification: The D6500 receiver checks each message for errors. Errors can be caused by a number of factors including noise on the telephone line or a malfunction in the communicator. If the data is received correctly, the receiver sends the kiss-off acknowledgment tone to the communicator. The communicator then hangs up and returns the subscriber's telephone line to normal.

If the data is not correct, the receiver withholds the kiss-off tone and prints an "ERROR" message (see Section 19. Error Reports), causing the communicator to retransmit the information. If the data is still not received correctly the communicator hangs up (Radionics communicators will usually try four times before hanging up). The communicator will then restart the signal process and attempt to retransmit another message. The communicator will repeat this process until the signal acknowledgment tone is received or until the number of dialing attempts has been depleted.

Acknowledgment Tone Compatibility: When the D6500 Receiver answers an incoming line, it waits for a programmed number of seconds before transmitting the acknowledgment tone(s). Radionics communicators will wait approximately 30 seconds for the proper acknowledgment tone, however *some other brands of communicators will hang up immediately if an improper acknowledgment tone is heard, and others may have a very short acknowledgment wait time.*

> **Radionics recommends that you program the line card so that the first acknowledgment tone transmitted is compatible with existing equipment which will not wait through a sequence of acknowledgment tones.**

14.2 How Messages are Received

When a Message is Received: The receiver can process messages from all eight phone lines simultaneously. Each message is held in a temporary memory buffer while it is checked for accuracy of transmission. The messages are printed and displayed one by one as the previous message is cleared from the display.

Radionics Control/Communicators can transmit multiple messages in the same phone call. The receiver may be programmed to print all multiple message transmissions as a group, or print each message as soon as it is received. Refer to program item *Call Blocking* in the *D6500 Program Entry Guide* for more information.

As each message is checked and determined to be accurate, the D6500 sends the kiss-off acknowledgment tone so the communicator can hang up, thus allowing the receiver to process new incoming calls on the line. As reporting devices (e.g. printer, auxiliary CRT) become available to receive additional signals, the D6500 retrieves the stored messages from memory then outputs the messages to the reporting devices.

How Call Groups Work: Programming in the 6500:MPU Product handler allows each line card in the D6500 receiver to report and print as a part of a *call group.* Lines which operate in rotary are typically assigned to the same call group. A call group can include any combination of incoming lines, regardless of the physical location of the line card in the receiver, or the geographical location of the accounts which report to the various lines in the group. When a line is assigned to a call group, all reports on that line (with the exception of phone line or line card trouble reports) are identified by the group number (e.g.: G1).   If the line is not assigned to a group, all reports are identified by the line card number (e.g.: L1) (see Section 17, Busy Seconds, for further details on call groups).

Buzzer Operation: In the Manual Mode an Operator Alert Buzzer sounds and an auxiliary relay closes when a message is received. The buzzer sounds and the relay remains closed until you press the SLNC button (the buzzer operation is programmable and can be disabled when the receiver is programmed for the Automatic Mode).

The auxiliary relay can be used to activate a remote buzzer or a similar device. The output terminals for the auxiliary relay are located on the Power Supply Terminator Card (see Figure 7-2). The relay is rated at 2 amps (24VAC/DC) and is dry contact; it does not provide power for the auxiliary device.

Reporting Devices, Primary and Secondary: A reporting device is any device which can print or display messages from the D6500 receiver. This includes the D6550 Printer (internal printer), a central station automation computer, external printer or auxiliary CRT connected to the D6555 port. Program items in the 6500:MPU program enable the internal printer, external printer, and automation computer and designate them as *primary* or *secondary* devices. *Primary Reporting Devices* receive all reports generated by the D6500. *Secondary Reporting Devices* only receive input from the D6500 when all primary devices fail.

If the receiver is in the Automatic Mode and *ALL* of the primary reporting devices fail the receiver re-routes the messages to the secondary reporting device(s). If no secondary reporting devices are programmed, or if all secondary reporting devices fail, the D6500 will automatically switch to Manual Mode. When a primary device is restored to normal operation, the D6500 goes back into the Automatic Mode, provided that the last buffered signal was manually acknowledged (refer to Section 16, Receiving Signals at the D6500).

15. D6500 Standard 40-Character Reporting Format

When the printer in the D6500 is a primary reporting device (see the *D6500 Program Entry Guide*) it records all incoming signal activity as well as several supervisory and diagnostic messages regarding the receiver's operation. As the printer records activity, the electro-conductive paper tape (part number D6007) scrolls out of the printer. The most recent messages appear at the top of the tape as it comes out of the printer.

The D6500's LCD display , the D6500 Internal Printer Module and any external devices connected to the CRT RS-232 Port of the Printer Terminator Card, all use the same standard 40-character format.

Date	Time	Format	Account Identification	Type of Event	Zone
1 2 3 4 5	6 7 8 9 10 11	12	13 14 15 16 17 18 19 20 21 22 23 24	25 26 27 28 29 30 31 32 33 34 35	36 37 38 39 40
11/29	15:32	B3	ACCT 485	ALARM REPORT	
11/29	15:34	L3	ACCT 642	RESTORAL ZN 4	
11/29	15:41	M3	ACCT 1523	ALARM ZN 100	
11/29	15:44	G3	ACCT 3874	CLOSING ID B02	

Figure 15-1: Single line 40-character message format

Date	Time	Format	Account Identification	Type of Event	Zone
1 2 3 4 5	6 7 8 9 10 11	12	13 14 15 16 17 18 19 20 21 22 23 24	25 26 27 28 29 30 31 32 33 34 35	36 37 38 39 40
11/29	15:32	M3	ACCT 485	ALARM REPORT	
+++ ACCT 485				AREA=4 POINT=284	

Account Identification		Event Information: Zone Area, Point, User ID, Sked, Relay #

Figure 15-2: Double line 40-character message format

15.1 Interpretation of Reports

Reports output by the D6500 are presented in a standardized 40-character x 2 line format. The second line of the display is used only for receiver diagnostics, idle displays, and Modem II messages. This format offers a consistent arrangement of account reports, as well as D6500 diagnostic messages. Two formats are available: the Single Line format and the Double Line format (see Figures 15-1 and 15-2). The Single Line format is the standard format for messages received in pulse, BFSK, and Modem II transmission formats. The Double Line format is used for D7112 and D9112 Modem II message formats. Modem IIe/IIIa2 format messages use additional lines for messages containing text.

Single and Double Line Formats

DATE (**1 thru 5**): Displayed in a MM/DD format.

TIME (**7 thru 11**): Displayed in a HH/MM format.

FORMAT (**13 thru 14**): Identifies the Line or Group Number. If the Line is *not* programmed to report as part of a "Group", position 13 can identify the Transmission Format (`L` = Pulse, `B` = BFSK, `M` = Modem II). D6500 internal reports appear with an "`L`". If the Line *is* part of a "Group", a "`G`" appears in position 13 (see the *6500 Program Entry Guide*). Position 14 shows the line card number or Group number receiving the report.

ACCOUNT IDENTIFICATION (**16 thru 25**): Shows the Control/Communicator's account identification number. *Pulse* (3x1 and 3x2*) and *BFSK* formats can report account numbers containing up to three characters (positions **22** thru **24**). *Pulse* (4x1 and 4x2*) and Radionics *Modem II* formats can report account numbers containing up to four characters (positions **21** thru **24**). Radionics *Modem IIIa2* formats can report account numbers containing up to ten characters (positions **16** thru **25**) See Figure 15-3 for a comparison between formats.

Single Line Format

TYPE OF EVENT (**26 thru 33**): Shows the type of event (Alarm, Restoral, Opening, Closing, Error, etc.) that triggered the report.

ZONE (**35 thru 40**): Displays the zone on which the event occurred. Refer to Figure 14-2 for a comparison between formats.

Pulse and BFSK: Positions **35** and **36** always shows "`ZN`". Pulse (3x1 and 4x1*) and BFSK formats can report only single character zone identification, using position **40**. Pulse (3x2 and 4x2*) formats can report up to two characters using positions **39** and **40.**

Modem II: Positions **35** and **36** may show "`ID`" instead of "`ZN`". "`ID`" is used to identify combinations used to arm and disarm a D8112, D6112 or D4112 system programmed for opening/closing reports. Position **40** will only be used if it is communicating an opening or closing with a combination beginning with "9", if it is sending a Restoral or Trouble ZN 9, a Duress, or a status report. In all other cases Modem II will always use positions **38** thru **40** for any other zone, point, or combination being communicated.

Double Line Format

TYPE OF EVENT (**26 thru 40**): Shows the type of event (Alarm, Restoral, Opening, Closing, Error, etc.) that triggered the report.

Line 2:

+++ (**1 thru 3**): Identifies the second line as a continuation of the previous line.

ACCOUNT IDENTIFICATION (**5 thru 14**): Shows the Control/Communicator's account identification number. Account numbers containing up to ten characters (positions **5** thru **14**) can be reported.

ADDITIONAL EVENT INFORMATION (**25 thru 40**): Shows the expanded information provided by Modem IId, Modem IIe, and Modem IIIa2 formats. This may include the "Area" number, "Point" number, "RF Point" number, "User" ID, "Operator" ID, "Relay" number, "Sked" number, "Phone #", "Phone Line" number, "SDI" number, and "Time". See the *D6500 Report Directory* (P/N *74-04651-001*) for a complete listing of the signals which can be received in Modem II formats.

FORMAT	NUMBER OF DIGITS			ID	ZN
	Account	**Area**	**Zone/ Point**		
Pulse 3x1	3		1		X
3x2	3		2		X
4x1	4		1		X
4x2	4		2		X
BFSK	up to 3		1		X
Modem II	up to 4		3	X	X
Modem II *(for D9112 and D7112)*	up to 4	1	3	X	X

Figure 15-3: Format comparison chart

15.2 Message Examples

Below are some examples of messages that may be received at the D6500. A more complete directory of reports is found in the *D6500 Computer Interface Manual* (P/N *74-05313-000*) and in the *D6500 Report Directory* (P/N *74-04651-001*).

The following are examples of special reports which have a multiple line format.

Status reports print as follows (not used for Pulse):

BFSK Example:

```
10/13 18:31 B1 ACCT   105 STATUS REPORT
10/13 18:31 B1 ACCT   105 RESTORAL ZN    2

10/13 18:30 B1 ACCT   234 STATUS REPORT
10/13 18:30 B1 ACCT   234 RESTORAL ZN    1
```

Modem II Single Line Example:

```
10/13 18:31 M1 ACCT B123 STATUS REPORT
10/13 18:31 M1 ACCT B123 RESTORAL ZN    2

10/13 18:30 M1 ACCT 6677 STATUS REPORT
10/13 18:30 M1 ACCT 6677 RESTORAL ZN    1
```

Modem II Double Line Example:

```
10/13 18:31 M1 ACCT 5687 S: TROUBLE
+++ ACCT 5687           AREA=1 POINT=123

10/13 18:30 M1 ACCT C167 S: TROUBLE
+++ ACCT C167           AREA=4 POINT=102
```

Signals transmitted during an AC Failure at the protected premises print as follows (not used for Pulse):

BFSK Example:

```
10/13 18:32 B1 ACCT  105 AC FAILED
10/13 18:32 B1 ACCT  105 RESTORAL ZN  8

10/13 18:31 B1 ACCT  105 AC FAILED
10/13 18:31 B1 ACCT  105 RESTORAL ZN  7
```

Modem II Single Line Example:

```
10/13 18:32 M1 ACCT B123 AC FAILED
10/13 18:32 M1 ACCT B123 RESTORAL ZN 801

10/13 18:31 M1 ACCT B123 AC FAILED
10/13 18:31 M1 ACCT B123 RESTORAL ZN 700
```

Modem II Double Line Example:

```
10/13 18:32 M1 ACCT 5687 AC FAILURE
10/13 18:32 M1 ACCT 5687 RESTORAL REPORT
+++ ACCT 5687          AREA=2 POINT=006

10/13 18:31 M1 ACCT C167 AC FAILURE
10/13 18:31 M1 ACCT C167 RESTORAL REPORT
+++ ACCT C167          AREA=3 POINT=010
```

Force Arming reports print as follows:

BFSK Example:

```
10/13 18:33 B1 ACCT  105 WAS FORCE ARMED
10/13 18:33 B1 ACCT  105 CLOSING  ZN   8
10/13 18:32 B1 ACCT  105 TROUBLE  ZN   7
```

Modem II Single Line Example:

```
10/13 18:33 M1 ACCT B123 WAS FORCE ARMED
10/13 18:33 M1 ACCT B123 CLOSING  ID 801
10/13 18:32 M1 ACCT B123 SHUNTED  ZN 700
```

Pulse (4x2) Example:

```
10/13 18:33 L1 ACCT 1243 ALARM   ZN  81
10/13 18:32 L1 ACCT 1243 ALARM   ZN  72
```

Modem II Double Line Example:

```
10/13 18:32 M1 ACCT 5687 WAS FORCE ARMED
+++ ACCT 5687           AREA=1 ID=013
10/13 18:32 M1 ACCT 5687 FORCED CLOSE

10/13 18:31 M1 ACCT C167 WAS FORCE ARMED
+++ ACCT C167           AREA=1 POINT=030
10/13 18:31 M1 ACCT C167 FORCED POINT
```

The following reports are shown as they would appear on the printer tape (oldest signal on the bottom, most recent signal on the top), followed by a brief explanation of each report.

```
11/22 13:45 L1 PHONE RESTORED    RCVR 05
```

On November 22 at 1345 hours (1:45 PM) the tele-phone line connected to Line 1 was back in service. (Internal diagnostic.)

```
11/22 13:02 L1 PHONE TROUBLED    RCVR 05
```

On November 22 at 1302 hours (1:02 PM) the telephone connected to Line 1 went into trouble condition. This indicates an open or short on the telephone line for more than 10 seconds.

```
11/22 12:03 L1 CARD RESTORED     RCVR 05
```

On November 22 at 1203 hours (12:03 PM) the line card or terminator card for Line 1 was back in service.

```
11/22 12:00 L1 CARD TROUBLED     RCVR 05
```

On November 22 at 1200 hours (Noon) the line card or terminator card for Line 1 went into trouble condition.

```
11/22 10:00 L8 ACCT  888 [TEST]  ZN   8
```

On November 22 at 1000 hours (10:00 AM) the TEST Button on the D6500 receiver was pressed to initiate a printer test.

```
11/22 07:22 L2 ACCT  405 ALARM   ZN   8
```

On November 22 at 0722 hours (7:22 AM) an alarm occurred at account number 405, Zone 8. (Pulse 3x1 format.)

```
11/22 03:29 B3 ACCT  117 TROUBLE ZN   9
```

On November 22 at 0329 hours (3:29 AM) account number 117 went into low battery condition. (This indicates that AC power to the communicator was interrupted and the battery standby power is getting low.) The communicator was programmed for expanded reporting. (BFSK format.)

```
11/21 22:39 M1 ACCT  240 CLOSING  ID   3
```

On November 21 at 2239 hours (10:39 PM) account number 240 armed the burglar alarm system with a combination beginning with 93. (Modem II format.)

```
11/21 20:22 L1 ACCT  F33 RESTORAL REPORT
```

On November 21 at 2022 hours (8:22 PM) account number F33 was restored following an alarm or trouble condition. The zone is unknown since the communicator was not programmed for expanded reports.

```
11/21 20:15 L1 ACCT  F33 TROUBLE REPORT
```

On November 21 at 2015 hours (8:15 PM) account number F33 reported a trouble condition. The zone in trouble is not known since the communicator was not programmed for expanded reporting.

```
11/21 15:33 L1 ACCT  243 RESTORAL ZN   4
11/21 15:32 L1 ACCT  243 CANCEL   REPORT
```

On November 21 at 1532 hours (3:32 PM) an alarm occurred at account number 243. The subscriber turned the alarm off and closed the faulted loop (Zone 4) before the alarm was received at the central station. These printouts could also be caused by a subscriber who arrived at the premises after an alarm, disarmed the system and closed the faulted loop.

15.3 LCD Status Line Format

The 40-character LCD display line contains four fields of information (see Figure 15-4). Field 1 indicates the system mode, field 2 contains the system message, field 3 indicates buffer usage, and field 4 indicates the Listen-in status.

Sys Mode	System Message	Buffer Usage	Listen-In
1 2 3 4 5	6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	25 26 27 28 29 30 31 32 33 34	35 36 37 38 39 40
Auto:	System normal	82% Full	L/I:n

Figure 15-4: LCD 40-character display format

System Mode (1 thru 5)

The following System Modes can be displayed:

Auto: indicates that the system is in automatic mode.

Manu: indicates that the system is in manual mode.

Prog: indicates that the system is in program mode.

Init: indicates that the system is booting up.

System Messages (7 thru 24)

Three types of system messages can be displayed: Scrolling, Programmer, and System Test. If all selected devices are normal and the battery is not low, the "System normal" message is displayed (see Figure 15-4).

If multiple scrolling messages are applicable, each message is displayed for a 3 second interval. When the system is in Programming (**Prog:**) mode, the Programmer system messages take precedence over Scrolling system messages. **Test** messages also take precedence over Scrolling system messages.

Scrolling System Messages:

```
Check internal prt
Check external prt
Check automation
Low battery
```

Programmer System Messages:

```
Check programmer
Download failed
Copy to 6500
Copy from 6500
Programmer ready
Programming done
Receiver busy:n
```

Buffer Usage (26 thru 34)

The message buffer can hold up to 500 messages. The Buffer Usage field indicates 100% Full when 436 messages exist. After 436 messages are in the buffer, line cards can accept one additional message, and only internal messages are allowed to enter the buffer. When the message number is reduced to 415 messages (Buffer Usage = 94% Full), the line cards will again be able to accept phone messages.

Listen-In (36 thru 40)

This field indicates on which card Listen-in is active (L/I:n), and the number of the line card connected to the speaker.

16. Receiving Signals at the D6500

16.1 Operation in Manual Mode

The D6500 is programmed for Manual Mode using the 6500:MPU Product Handler Program.

NOTE: The Manual Mode is **not** suitable for monitoring burglar and fire alarm accounts in a UL listed Central Station. The D6500 receiver must be programmed for the Automatic Mode to comply with UL, FM, and NFPA standards for alarm monitoring.

Receiving Signals

When signals are received while operating in the manual mode:

1. *Reporting devices are activated and the Operator Alert Buzzer sounds.* Push the SLNC button to shut off the Operator Alert Buzzer. Compare the display to the printout to make certain you have correctly read the data.

2. *Push the* SLNC *button again.* If there are no additional messages the second push of the SLNC button clears the display. If there are additional messages the second push of the SLNC button allows the receiver to display and print the next message.

3. *Repeat the procedure until all outstanding messages are recorded on the reporting device(s) and the display is clear.* You must push the SLNC button to clear the display after each message and permit the D6500 to display additional messages. If a message is not cleared the Operator Alert buzzer will sound within approximately 40 seconds.

Typical Alarm Receiving Sequence in Manual Mode

1. An alarm occurs on Zone 3 at subscriber location 456. Account 456 is programmed to report to Line 1 and Line 1 is not programmed to report to a call group.

2. The RING indicator on the D6500 receiver comes on at the Line 1 position.

3. The OL (On-Line) LED lights when the receiver answers the call and the LED flickers as data is received.

4. The Operator Alert Buzzer sounds.

5. The D6500 LCD displays the alarm message in the standard 40 character format.

6. The primary reporting device(s) (e.g. internal printer, external printer, or automation computer) is activated. If the internal printer is a primary reporting device and the message is in *Pulse* or *BFSK* format, it prints the following message (BFSK format is displayed with "B1" instead of "L1"):

```
11/11 14:10 L1 ACCT  456 ALARM    ZN   3
```

If the message is in a *Modem* format, the receiver's internal printer prints the following:

```
11/11 14:10 M1 ACCT  456 ALARM    ZN 300
```

7. Operator pushes the SLNC button to silence the Operator Alert Buzzer.

8. Operator compares the display to the printout for accuracy.

9. Operator pushes the SLNC button again, clearing the display panel. (If the SLNC button is not pushed this second time the Operator Alert Buzzer will sound to remind you to clear the display.)

10. The receiver is now ready to display any additional messages.

16.2 Operation in Automatic Mode

The D6500 is programmed for Automatic Mode using the 6500:MPU Product Handler Program.

Operating the D6500 receiver in the Automatic Mode meets Underwriters' Laboratories (UL), Factory Mutual (FM) and National Fire Protection Association (NFPA) standards for burglar and fire alarm monitoring. If you are using the D6500 receiver to monitor any fire alarm accounts, you must operate the receiver in the Automatic Mode. This also applies when connected to a central station automation computer.

In the Automatic Mode the D6500 receiver sends messages immediately or in blocks to reporting devices (e.g.: printers, computers) as soon as the devices are ready to receive the information (see program item Call Blocking in the D6500 Program Entry Guide). Signals do not remain visible in the display. The display is cleared and made ready to receive other signals immediately after the message is recorded on the reporting device(s). In the event that all reporting devices fail, the D6500 reverts to the Manual Mode of operation until a device is returned to service (refer to the Computer Interface Installation Manual). The D6500 is normally programmed to sound the Operator Alert Buzzer while messages are being printed.

Typical Alarm Receiving Sequence in Automatic Mode

1. An alarm occurs on Zone 3 at subscriber location 456. Account 456 is programmed to report to Line 1 and Line 1 is not programmed to report to a call group.

2. The RING indicator on the D6500 receiver comes on at the Line 1 position.

3. The OL (On-Line) LED lights when the receiver answers the call and the LED flickers as data is received.

4. The Operator Alert Buzzer sounds (if 6500:MPU program item *Buzz In Auto* is programmed **Yes**, AND if either the internal printer or external printer is programmed as a primary device).

5. The alarm data momentarily appears on the Receiver's LCD Display.

6. The primary reporting device(s) (e.g.; internal printer, automation computer) is activated. If the internal printer is a primary reporting device and the message is in *Pulse* or *BFSK* format, it prints the following message (BFSK format is displayed with "B1" instead of "L1"):

```
11/11 14:10 L1 ACCT  456 ALARM    ZN   3
```

If the message is in a *Modem* format, the receiver's internal printer prints the following:

```
11/11 14:10 M1 ACCT  456 ALARM    ZN 300
```

17. Busy Seconds (Line Busy) Reports

The D6500 receiver software monitors and reports the time that a "*call group*" of receiver lines is unable to receive signals. The receiver cannot process signals if its incoming phone lines are in trouble, if other communicators have the line tied up, or if the line card is inoperative. The receiver interprets these conditions as "busy time."

Busy Seconds Reports are based on the amount of busy time accumulated during a ten minute period. The ten minute busy time period begins when all lines in a call group become busy *(or when a single line which is not programmed for a call group becomes busy).* The D6500 totals the accumulated busy time and prints the Busy Seconds report after the ten minute period is over. A minimum accumulation of 60 seconds (10%) of busy time is required before a report is generated. The D6500 will report up to a maximum of 100% busy time.

If Busy Seconds reports are not wanted, it is possible to disable them by programming item *Busy Second Rpts*, in the MPU program, **No**. This function is not selectable by line card. *Busy Seconds must be **Yes** for UL listed Central Stations.*

Underwriters' Laboratories inspectors may investigate the amount of time that the digital receiver lines are unable to receive signals. It is very important to ensure that lines are available to process emergency signals on a timely basis. Excessive line busy reports may indicate that it is necessary to install additional lines in rotary with your primary receiver lines.

Each line card can be assigned to a call group through program entries in the 6500:MPU Product Handler program. A line card can be assigned to group numbers 1 through 8. For the group to start accumulating busy time, all lines in the call group must either be on-line, in trouble or without an operating line card. (Note: Although it is not mandatory, Radionics recommends that you assign lines to a call group. If a line is not assigned to a group, or if there is only one line in the group, one minute of busy time during a 10 minute period will result in a Busy Seconds report.) If you do not assign a line to a call group, displays and printer reports identify the LINE number, instead of GROUP number. A line busy report is displayed and printed as follows:

```
11/19 06:20 L1 BUSY SECONDS  23% RCVR 01
```

18. Listen-In

NOTE: This feature is not suitable for use on units used for monitoring UL Certified accounts since it may delay the receipt of alarm signals.

The D6500 will decode the first digit of the account number of the message to determine if Listen-In is required. The range of digits that will initiate Listen-In is selectable by line card. The range is programmed in items Low Acct Digit and High Acct Digit of the line card program. The amount of time the D6500 will listen-in is determined by line item Duration in the line card program.

When transmitting in BFSK or a Modem format, the listen-in time is determined by the listen-in time programmed in the panel.

The D6500 will accept additional information during refresh cycles. If the communicator has information other than alarms it will be sent at refresh time. If another alarm is generated, the communicator will hang up and call back to the central station.

When multiple Listen-In calls are received at the same time, the operator can switch from line to line by pressing the Listen-In (LI) button on the front of the line card. Only lines connected to the speaker can be made to hang up. This is done by pressing the Listen-In (LI) button on the front of the line card one time. If a line card is not connected to the speaker, one press of the Listen-In button will connect that line to the speaker and the next will cause that line to hang up.

During Listen-In, the current card number connected to the speaker is displayed on the D6500 LCD display.

19. Error Reports

19.1 Description

If a message is garbled (incorrect checksum or inconsistent message rounds) due to a noisy phone line or other difficulty, the receiver withholds the acknowledgment tone. This causes the communicator to retransmit the same message. *Even if the communicator has more than one message to send, it does not attempt to transmit another message until it receives the acknowledgment tone for the first message.* Radionics communicators will retransmit a message up to four times. After four consecutive error messages are received the receiver hangs up so the communicator can re-dial the receiver and possibly establish a better connection. Some error messages may cause the receiver to immediately hang up and re-initialize the line card. When this happens, the printer prints a report with the following format:

```
 MM/DD HH:MM L# DIGITAL LC 06.00  RCVR ##
```

When you receive an error message, first try to determine the location and type of signal so that you can dispatch the proper response. Make a note of the time, date, line number and the account number on which the error occurred. *Any information that has an* [ERROR] *on the same line is probably incorrect.*

Sometimes an Error Message contains one line of clear signal enabling you to determine the actual location and type of signal being transmitted. For example:

```
10/13 09:22 L1 ACCT  096 [ERROR]   ZN   5
10/13 09:22 L1 ACCT  B11 TROUBLE   ZN   6
10/13 09:21 L1 ACCT  F02 [ERROR]   ZN   2
10/13 09:21 L1 ACCT  F96 [ERROR]   ZN   5
```

The D6500 displays and prints each message *as received* along with the word "[ERROR]." All of the messages transmitted in a single call can be printed as a group if 6500:MPU program item *Call Blocking* is set to **Yes**.

The receiver's diagnostic routines analyze the messages to determine whether the message was sent via BFSK, Modem, DTMF, or Pulse format. As a troubleshooting aid, the receiver prints supplementary "Pulse Error" reports when erroneous signals are transmitted in Pulse format, or IF the line card receiving the signal is programmed for expanded Pulse Error reports in 6500:LINE program item *Pulse Errors*. (For an explanation of expanded Pulse Error Reports, see Section 19.4).

When to Report Communication Trouble: If you receive several error messages from a particular location, your supervisor and/or service personnel should be notified to service that location. If you receive error messages from several accounts on one receiver

line, the problem could be the receiver's line card or the telephone line connected to the line card. You may need to report the trouble to the telephone company. If you have a consistent problem with errors, it may be necessary to call Radionics Customer Service for assistance (see Section 2, Emergency Procedures).

19.2 BFSK Error Reports

Communicators programmed for BFSK transmission use a series of tones to transmit data. BFSK transmissions can carry more data and transmit faster than Pulse transmissions. If an error message is received in BFSK, the receiver decodes the message as received, but does not print any alarm information or supplementary reports. For example, the receiver would print the following BFSK error messages as they were received in the same phone call:

```
10/13 09:29 B1 ACCT       [ERROR]   ZN
10/13 09:29 B1 ACCT       [ERROR]   ZN
10/13 09:28 B1 ACCT       [ERROR]   ZN
```

19.3 General Error Reports

General [ERROR] message can be for *Pulse*, *BFSK, or Modem formats*. The transmission format is determined by the character to the left of the line card number, before ACCT is printed. M is for *Modem formats*, B is for *BFSK*, and L is for *Pulse* or line card number.

19.4 Pulse Error Reports

Expanded Pulse Error reports are printed along with the General Error Messages when they are enabled in 6500:LINE program item *Pulse Errors.* Pulse transmissions use a single tone to carry the communicator's message. The tone's presence and absence on the telephone line at pre-determined intervals create digits which define the message (the operation is similar to the pulses used to dial telephone numbers with rotary dial telephones). Pulse Error report information could be very valuable to field service personnel as they troubleshoot communication problems.

When erroneous messages are received in Pulse format, the D6500 can print supplementary messages so that the probable cause of the error can be determined. The supplementary message is printed *before* the actual error message to identify the report which follows as an error message. Each round of the error message is printed *as it was received.* A Pulse transmission containing errors could print as shown in Figure 19-1 (read lines from bottom to top, as they would appear on the printer).

```
10/13  09:29  L2  ACCT   234    TROUBLE    ZN    3      <-Message 6    This is a valid signal
10/13  09:28  L2  ACCT   BFF    [ERROR]    ZN    3      <-Message 5    Error Message
10/13  09:28  L2  PULSE  ERROR  3 40       RCVR  01     <-Message 4    Supplementary Message
10/13  09:28  L2  ACCT   FFF    [ERROR]    ZN           <-Message 3    Error Message
10/13  09:28  L2  PULSE  ERROR  4 30       RCVR  01     <-Message 2    Supplementary Message
10/13  09:27  L2  ACCT   234    TROUBLE    REPORT       <-Message 1    This is a valid signal
```

Figure 19-1: Pulse Error Reports

Message Interpretation (Figure 19-1):

Message 1: When the communicator transmitted the first message, no error was detected.

Message 2: While the second message was being transmitted a Pulse Error occurred. This Pulse Error report identifies the following error message as a double-round transmission in which an incorrect number of digits were received.

Message 3: This is the actual signal as received in the second round of the transmission.

Message 4: This Pulse Error report identifies the following report (second round) as a double-round transmission in which the rounds did not match.

Message 5: This is the actual signal as received in the second round of the transmission.

Message 6: On this attempt at transmitting the second message, no error was detected.

The digits following PULSE ERROR in the Supplementary Messages are used to identify the kind of transmission error detected, the communicator zone which initiated the signal, and the "checksum digit." These significant digits are identified as follows:

```
10/09 09:28 L2 PULSE ERROR 3 30   RCVR 01
```

Type of Error
Number of Digits Received
Last Digit Received

Type of Error:

1 = *Failed the Ratio Test.* Too much variation in the pulse lengths. Parameter *Pulse Plus %* may affect this condition.

2 = *Single Round Checksum Error.* The digits received did not equal the pre-determined checksum number.

3 = *Double Round Comparison Error.* The information received was not the same in both rounds.

4 = Double-round incorrect number or digits.

5 = Single-round incorrect number of digits.

Number of Digits Received:

The number of digits received from the communicator in the round.

Last Digit Received:

A digit added to single-round transmissions which, when added to the other digits in the message equals a number which is evenly divisible by 15. If the sum of all of the digits in the transmission is not evenly divisible by 15, the message is reported as an error.

19.5 Modem II, IIe, IIIa2 Error Reports

Communicators programmed for Modem formats carry more data in a phone call than Pulse or BFSK transmissions. If an error message is received in a Modem format, the receiver decodes the message as received, but does not print any supplementary reports. For example, the receiver could print the following Modem error messages as they were received in the same phone call:

```
10/09 13:02 M1 ACCT 8112 (ERROR)   ZN   100
10/09 13:02 M1 ACCT 8112 (ERROR)   ZN   100
10/09 13:02 M1 ACCT 8112 (ERROR)   ZN   100
10/09 13:02 M1 ACCT 8112 (ERROR)   ZN   100
```

19.6 Service Required Messages

A service required message is generated by the receiver when one of the following conditions occurs:

1. A GSC Slave Dialer transmitting in single round format should be reprogrammed for double round.

2. The receiver received 10 or more pulses in a pulse format transmission.

3. A D8112G1 control panel with *Line 121 Modem* set to **Yes** should be reprogrammed to **No**.

20. Troubleshooting Guide

The D6500 Receiver is made up of several plug-in assemblies which you can easily replace in the field. (Components and controls on individual assemblies are shown starting at Section 4.)

Do not attempt to repair individual assemblies. Any failed assemblies should be returned to Radionics for testing and repair. This Trouble Shooting Guide can be used to assist in the identification of failed modular components. Diagnostics are built into the D6500 Receiver which monitor the status of the line cards, Power Supply, and Printer.

The D6500 can be programmed so that some features do not function. Check the programs loaded into the receiver to verify that the feature is enabled before assuming that a component has failed.

Individual Trouble Cases, Troubleshooting Procedures

AC Indicator is Flashing.

AC power not available to the Receiver.

1. Check the AC switch on the Power Supply Card. Make sure it is in the "up" position (on).

2. Check 120-volt commercial AC power branch circuit.

3. Check to see that the plug-in transformer is supplying between 17 and 19 volts AC.

4. Press the AC Circuit Breaker (CB1) reset button on the Power Supply Terminator Card.

AC Indicator is Flashing and BAT Indicator is On.

AC power not available to the Receiver and the internal standby batteries have discharged to 11.7VDC or less.

1. If the central station is not experiencing a commercial power failure, check AC power connections to the receiver as outlined above.

2. If the central station is experiencing a commercial power failure, check the Battery switch on the Power Supply Card to make sure it is in the "up" position (on). Connect an external power supply to the receiver.

BAT Indicator is On and AC Indicator is On.

Internal standby batteries may be discharged even though AC power is connected.

Note: The BAT indicator stays lit after AC restores until the batteries are recharged to 13.2 VDC. If the BAT indicator stays lit beyond normal recharging time:

1. Check the Battery switch on the Power Supply Card to make sure it is in the "up" position (on).

2. Press the Circuit Breaker (CB3 and CB4) reset buttons on the Power Supply Terminator Card.

3. Check all battery connections (e.g.: connector J3 on Power Supply Terminator and Battery Terminals).

4. Replace the D126 Batteries. If the BAT indicator is still on, replace the Power Supply Terminator Card.

5. If the BAT indicator is still on, replace the Power Supply Card.

Line Card TRBL, RING and OL Indicators Come On.

If the line card is trying to boot but not communicating with the MPU the following may occur:

1. All three lights on the line card come on and stay on for about four seconds.

2. The OL (On-Line) light is on for approximately 17 seconds.

3. All three lights go back on for about four seconds

Verify that the line card is programmed to be supervised.

Line Card TRBL (Trouble) Indicator is Illuminated.

Either the telephone line, the telephone connecting cord, line card, or Telco Terminator is defective.

1. Pull the line card out of the receiver, then re-insert it to insure the card is properly connected.

2. Swap the connecting cord with a phone line which is not in trouble. If the original TRBL indicator remains illuminated, the problem is with a plug-in card. Replace the line card with a spare. If the TRBL indicator on the new replacement card is illuminated, change the Line Terminator Card.

3. If the TRBL indicator on the original troubled card goes out and the TRBL indicator on the previously un-troubled card illuminates when you swap connecting cords, the trouble is with either the connecting cord or the telephone line. Replace the telco line connecting cord.

4. *If the TRBL indicator is still lit, the trouble may be in the telephone line.* Report the trouble to Telco.

NOTE: If a telephone line is out of order, and is the first line in a rotary or hunt group, IMMEDIATE ACTION IS NECESSARY! Have the telephone company busy the defective line at the telephone exchange. If emergency service is not available, call the troubled line and leave the calling handset off-hook. **Do not hang up!** Incoming alarm signals see a busy signal and rotor (hunt) to another line in the hunt group. This procedure will not work for WATS (Wide Area Telephone Service) Lines.

Clock and/or Calendar Cannot Be Set.

The receiver may not be programmed for time set.

1. Check the 6500:MPU program item enabling time setting.

2. Defective or loose cable between display panel and MPU Card.

3. Defective display panel.

4. Defective MPU Card.

Printer Works, But No Display.

1. Defective or loose cable between MPU Card and display panel.

2. Defective MPU Card or defective Power Supply Card.

Operator Alert Buzzer Cannot Be Silenced.

1. Push TEST Button for printer test. *If printer is inoperative you may be hearing the Printer Buzzer instead of the Operator Alert Buzzer.* Printer Buzzer sounds when the Printer Circuit Card has no DC power. Power-down the receiver and remove the Printer Module. Press the circuit breaker reset button (CB1) on the Printer Module's circuit board (see Figure 8-3).

2. *Defective Silence Button.* Replace the MPU Card.

Printer Inoperative, Display and Operator Alert Buzzer Work.

1. Paper out of contact with Paper Sensor .

2. Printer Control Switch turned off.

3. Circuit breaker on Printer Module tripped. Power-down the receiver and remove the Printer Module. Press the circuit breaker reset button (CB1) on the Printer Module's circuit board (see Figure 8-2).

4. Defective Printer Module.

5. Defective MPU Card or Power Supply Card.

Caution: *If it is ever necessary to return the Printer Module to Radionics for repair, it MUST be packaged carefully. Excessive stress placed on the printer circuit board may cause hairline fractures in the board, making it un-repairable.*

Printer Buzzer Sounds But No Display (Buzzer Can Not Be Silenced)

Printer Buzzer sounds when the Printer Circuit Card has no DC power.

1. Power-down the receiver and remove the Printer Module.

2. Press the Circuit Breaker Reset Button (CB1) on the Printer Module's circuit board (see Figure 8-2).

21. Using External Reporting Devices with the D6500

21.1 Central Station Automation System Computer

A central station automation system computer can be connected to the "COMP RS-232" port (Automation Computer port) on the D6515 MPU Terminator Card (see Figure 6-2). The output from the automation port is configured by programming in the 6500:MPU product handler program (see the *D6500 Program Entry Guide*).

RS-232 Jumper Configuration: Configuration jumpers on the D6515 MPU Terminator Card are used to set the data control lines for the automation computer RS-232 port. For information on configuring the output from the D6500 see the *D6500 Computer Interface Installation Manual* (P/N *74-05313-000*).

CAUTION

Caution: *If you are not connecting an automation computer to this port, LEAVE THESE JUMPERS IN THE STANDARD POSITION AS SHIPPED. Certain jumper configurations could cause permanent damage to the RS-232 output and may also damage other components in the D6500.*

21.2 Auxiliary CRT or Printer

Printer Terminator Card CRT RS-232 Connection: The port on the D6555 Printer Terminator Card provides a CRT or external printer output which matches the D6500 Internal Printer's output. Reports from this output are provided as formatted on the printer tape. See section 8.2 for jumper information. For baud rate programming, etc., see the *D6500 Program Entry Guide*.

22. Central Station Tips

BACKUP RECEIVER: Spare circuit boards and/or receivers should be available at the central station. Radionics recommends that a spare D6550 Printer be kept on hand. UL listed central stations monitoring burglary or fire alarms are required to have a redundant receiver available which can be activated within thirty (30) seconds.

Radionics does not support operation of receivers in parallel. Don't have the spare equipment wired up, powered or in the same equipment rack as the primary equipment. This minimizes catastrophic failures caused by direct lightning strikes.

COMPUTER INTERFACE: Spare cards for all receiver components are strongly recommended. A spare MPU Terminator Card with jumpers properly configured should be kept in the central station.

D5200 REMOTE PROGRAMMER: Radionics recommends that you keep a D5200 programmer loaded with the 6500:MPU and 6500:LINE Product Handlers in the central station at all times.

PHONE LINES

Emergency Ringers: Extension ringers for incoming receiver phone lines are available from telephone equipment supply companies. They ring very briefly to signify an incoming call. If they continue to ring, that means your receiver is out of service. The ringer has a volume control but in a high traffic central station you might prefer to use beehive lights instead of ringers.

Rotary Lines: Rotary receiver lines (hunt groups) are strongly recommended to prevent alarm signals from being delayed during periods of busy central station traffic. Rotary lines also are important to provide alternate paths when a line is out of service. To use this important feature your dispatcher should dial the out-of-service line and leave the calling phone off the hook. This will busy out the line to all incoming communicators and they will automatically rotor to an unused line. Rotary service is provided at the Telco Central Office and must be ordered.

Essential Service: Many phone companies provide a higher level of service for community services such as police, fire, or hospital facilities. During outages these essential services receive repair priority over regular customers. Check with the phone company to see if your company qualifies for this important benefit.

Alternate Routes: In many service areas the telephone company can supply a back-up line or route your second line through different trunk routes than your first data line. This helps prevent trunk problems from disabling your central station. Check with the telephone company to see if this service is available in your area.

WATS Lines: WATS (Wide Area Telephone System) lines can provide a low cost method of monitoring long distance accounts. However some WATS lines do not have voltage until a signal is actually ringing in; the Model D6500 Receiver shows line trouble on these lines until a call is actually received. To prevent this, order WATS lines with "idle voltage". If voltage lines are not available your D6500 can be programmed to *not* monitor line troubles.

Caution: UL and FM central station service standards require phone lines that are constantly monitored.

PROPER GROUND: Receivers should be connected to **earth ground**, not chassis or electrical ground. Measure the resistance of the Receiver ground to another ground. If the meter reads above 2 ohms, check your Receiver ground against a third ground. If the difference is still greater than 2 ohms, ground your Receiver to a different earth ground. Cold water pipes or a grounding rod usually make a good earth ground. The grounding wire should be heavy copper with as short and straight a run as possible. Avoid sharp bends in the ground wire because a large power surge might arc across the bend.

The Terminator Cards and their connection to the receiver cabinet provide the ground source for the receiver's circuit boards. The screws used to secure the Terminator Cards to the back of the receiver cabinet must be firmly tightened at all times.

WARNING: *If the mounting bracket screws are not tight, the receiver's operation could be erratic. The receiver could fail in the event of a short circuit or if foreign voltage is induced into the system.*

Put an anti-static mat in front of the Receiver to prevent electro-static discharge from operator to equipment.

RADIO FREQUENCY INTERFERENCE: The D6500 Receiver is microprocessor based. All microprocessors are susceptible to RFI (Radio Frequency Interference) especially at the 480 MHz and 950 MHz bandwidths used by walkie-talkies. Never key a walkie-talkie in the vicinity of the Receiver.

TEST COMMUNICATOR: A digital communicator triggered by an interval timer provides an excellent periodic check on your receiver and its phone lines. If you have more than one data line use a communicator for each line, or use a multiple number communicator.

23. Glossary

AC - Alternating Current

Acknowledgment Tone - A signal exchanged between transmitting and receiving equipment to indicate readiness to communicate or that a clear transmission has been received.

Auxiliary Power - Additional direct current power available from a communicator for powering protective devices such as smoke detectors.

BFSK - Binary Frequency Shift Keying (see FSK).

Battery - Source of stand-by DC power.

Cancel Report - A message sent to the central station receiver upon the disarming of a burglar alarm system after an alarm.

Card - A printed circuit board which is plugged into a main printed circuit assembly.

Central Office - The physical Telco location where subscriber phone lines are connected to the switched network.

Central Station - The room, equipment and operation that monitors alarms and dispatches the authorities.

Checksum - A method of checking accuracy of transmitted information. A number representing the total number of bits of information transmitted is included with the transmission. The microprocessor counts the bits of information received and compares its sum to the transmitted checksum number. If the numbers do not match, the transmission is in error.

Closing Report - The arming of a burglar alarm system and subsequent reporting to the central station.

Communicator - See Digital Communicator.

CRT - Cathode Ray Tube. The television display monitor used by a computer.

DC - Direct Current.

Dial Tone - A continuous signal (350 or 440 Hz) generated at the local telephone exchange to indicate that the system is ready for dialing.

Decimal - A numbering system based on 10 possible numerical choices: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

Digital Communicator - An electronic device used to transmit alarm signals from a subscriber to a central location by using the existing phone network.

Digital Dialer - See Digital Communicator.

Direct Wire - A method of transmitting alarm signals from one subscriber to a central receiving location by varying voltage levels, current or current direction.

DTMF - Dual Tone Multi-Frequency. A signaling method using set pairs of specific frequencies (such as in Touch Tone™).

EPROM - Erasable Programmable Read Only Memory. A method of semi-permanently storing data in an integrated circuit chip. EPROMs can be erased and new data entered.

ESS - Electronic Switching System. A computer controlled telephone exchange.

Expanded Report - A method of transmitting ALARM, TROUBLE and RESTORAL reports by zone.

Extension Ringer - A remote telephone bell.

FM - Factory Mutual System – A consortium of four very large insurance companies specializing in industrial and highly protected risk (HPR) fire insurance. FM does not recognize UL listings. All fire protection equipment installed in FM insured risks must be FMRC approved.

Factory Mutual Research Corporation (FMRC) – Serves as a testing laboratory to evaluate and approve various types of fire protection equipment and devices for use in FM insured properties.

Forced Arming - A method of overriding the safety feature which prevents arming with a faulted circuit on a communicator.

FSK - Frequency Shift Keying. A form of frequency modulation in which the modulating wave shifts the output frequency between predetermined values. This is a method of digital communication in which the two binary states are represented by two different frequencies.

Ground - 1) A metallic connection with the earth to establish earth ground potential. 2) The voltage reference points in a circuit.

Handshake Tone - A signal exchanged between transmitting and receiving equipment to indicate readiness to communicate or that a clear transmission has been received.

Hexadecimal - A numbering system whose base is the equivalent of the decimal number sixteen.

The following decimal numbers:

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and *15* are represented by the characters:

0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and *F* in Hexadecimal.

Interstate WATS - Wide Area Telecommunications Systems. Phone calls *between different states in the United States* using special phone lines. (WATS Lines are usually designated by an 800 Area Code. Charges are automatically billed to the receiving party rather than the calling party.)

Intrastate WATS - Wide Area Telecommunications System. Phone calls *within one state* using special phone lines. (WATS Lines are usually designated by an 800 Area Code. Charges are automatically billed to the receiving party rather than the calling party.)

Kiss-off - A tone sent from the Receiver to the transmitter to indicate that transmitter's message was received. Once the transmitter "hears" the Kiss-off tone it returns the telephone line to the on-hook condition if there are no more messages to be sent.

LED - Light Emitting Diode

Line Seizure - The prevention of one or both sides of a phone line from reaching the phones on that line while a device such as a communicator is using the line for transmission.

Local Control - An alarm device that activates an audible sounding device when it detects an alarm condition.

MOV - Metal Oxide Varistor. A variable semi-conductor resistor. See Varistor.

Modem II, IIe, IIIa2 Format Communications - A Control/Communicator signaling format which transmits at over twice the speed of BFSK communications. The accelerated transmission rate provides over twice the data of BFSK communications. Modem Formats utilizes a unique Modem acknowledgment tone, password, and kiss-off tone.

Microprocessor - An integrated circuit chip capable of performing programmed instructions.

Off-hook - A Telco term to describe the condition when a phone is lifted off its cradle. This is equivalent to placing 600 ohms across the two wires.

Opening Report - The disarming of a burglar alarm system and its subsequent reporting to the central station.

Program - A series of instructions for the microprocessor.

PROM - Programmable Read Only Memory. A method of permanently storing data in an integrated circuit chip. The data within the PROM cannot usually be changed.

Pulse Dialing - A method of selecting the called number by pulsing the phone line.

Restoral Report - A signal transmitted upon the removal of a trouble or alarm condition from an alarm circuit.

RF - Radio Frequency.

RFI - Radio Frequency Interference. Any electrical signal of sufficient force induced by radio frequency signals.

RJ11C - A Telco supplied connecting block used to attach customer provided equipment to Telco lines.

RJ31X - A Telco supplied connecting block used to attach customer provided equipment to Telco lines. Provisions are made for line seizure.

RJ33X - A Telco supplied connecting block used to attach customer provided equipment to Telco lines terminating in key equipment. Provisions are made for line seizure and lamp (A+A1) control.

RJ38X - Identical to RJ31X with addition of provision for Tamper Circuit.

Rotary - A Telco term for a series of phone lines which will switch from the primary line to other lines if the called line is busy. Rotary service is provided at the Telephone Company Central Office.

Rotary Dialing - See Pulse Dialing.

RS232 - The EIA (Electronic Industries Association) standards for Serial Binary Data Interchange between computers and their peripheral devices.

Short - An abnormal circuit condition in which a low resistance path excess current flow.

Software - A program stored in semi-conductor memory.

Supervised Account - A burglar alarm system in which the arming and disarming of the alarm system is recorded at a central station.

Supervised Circuit - An electrical circuit which detects circuit malfunctions (opens, shorts or open/shorts) and reports them separately from alarms.

Telco - Abbreviation for Telephone Company.

Touch-Tone™ **-** A method of dialing the phone number by transmitting dual tones (DTMF) instead of single frequency pulses. A registered trademark of AT&T.

U.L. - Underwriters Laboratories Inc., founded in 1864, is chartered as a not-for-profit organization under the laws of the State of Delaware, to establish, maintain, and operate laboratories for the investigation of materials, devices, products, equipment, constructions, methods and systems with respect to hazards affecting life and property. UL publishes several volumes of Standards dealing directly with the alarm industry. These Standards outline specific monitoring and supervisory procedures for central stations and installation requirements for alarm systems and central station facilities. Upon issuing a certificate of compliance to a qualified alarm company, UL field representatives periodically inspect certificated facilities to ensure that the alarm company maintains the facilities in compliance with the applicable Standards.

Varistor - A voltage dependent semiconductor whose resistance drops rapidly as voltage increases... Commonly used for surge protection.

VDC - Direct current voltage.

24. Service Information

(EMERGENCY DATA SHEET)

In the event of a central station Emergency, the following information will assist you to contact the necessary people and enables Radionics Customer Service Personnel to help you with your emergency. Have your supervisor provide you with the following information:

Supervisor's Name: _____   Emergency Tel.#: _____

Supervisor's Name: _____   Emergency Tel.#: _____

Telephone Co. Repair Svc. Tel.#: _____   Contact: _____

Power & Light Co. Repair Svc. Tel.#: _____   Contact: _____

Radionics Customer Service: M-F Normal Business Hours (800) 538-5807
                                After Hours and Weekends   (408) 757-8877 (No Collect Calls, please)

   Note: When calling for emergency central station service, please tell the operator "Receiver Problem".

Receiver Software Version #: MPU:_____   Line:_____   Printer:_____

        Incoming Receiver Phone Line Numbers:

        Line 1: _____   Line 5: _____

        Line 2: _____   Line 6: _____

        Line 3: _____   Line 7: _____

        Line 4: _____   Line 8: _____

Are Lines in Rotary ? Yes: _____   No: _____

Type of WATS Lines?   Local: _____   Statewide: _____   National: _____   Other: _____

Location of Receiver Spares Package: _____

Location of Receiver Ground Wire Connection: _____

Location of AC Power Transformer for Receiver: _____

Location of Telephone Line Jacks: _____

Receiver Connected to Computer System - Yes: _____ No: _____

        Automation System Manufacturer: _____

Automation Computer Jumper Configuration (configuration jumpers located on MPU Terminator Card):